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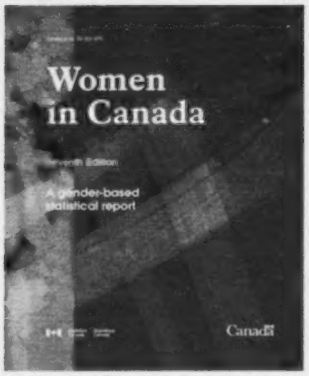
Women in Canada: A Gender-based Statistical Report

Women and Education: Qualifications, Skills and Technology



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.. not available for a specific reference period
... not applicable
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0^s value rounded to 0 (zero) where there is a meaningful distinction between true zero and the value that was rounded
^{p} preliminary
^{r} revised
x suppressed to meet the confidentiality requirements of the *Statistics Act*
^{E} use with caution
F too unreliable to be published
* significantly different from reference category ($p < 0.05$)

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Women and Education: Qualifications, Skills and Technology

Introduction

Canada's knowledge-based economy – especially the fields of science, technology, engineering and mathematics (STEM) – continues to grow. Related changes in the economy, including shifts to globalized markets and an emphasis on innovation and technology, all mean that education is more and more an integral component of economic and social well-being.

At the same time, women in Canada have become increasingly well-educated and today represent a larger share of the labour market than they have ever represented previously. However, women continue to have fewer apprenticeship or trades certificates as well as STEM university degrees than their male counterparts.

The trajectory of women's education and career path can be understood through the lens of a 'pipeline' metaphor. Researchers have used this perspective to talk about women in STEM, noting that there are 'leaks' in the pipeline in the earliest years of schooling right through to employment with many women either studying in non-STEM fields or subsequently not working in occupations related to STEM fields of study.

This chapter begins with an overall profile of women's education in Canada and then examines various points along the pipeline such as mathematics and reading skills in high school, young women who are not working or in school, field of study patterns and labour market outcomes and employment income of STEM and non-STEM fields of study.

Educational attainment among women has increased significantly

Women have sustained a long-term trend toward higher education by increasingly completing postsecondary qualifications (Chart 1a).[1]

The proportion of women aged 25 to 64 with a university certificate or degree[2] grew at a faster pace than that of men, more than doubling between 1991 and 2015 from 15% to 35%. The proportion of men with a university certificate or degree also grew during that time period, but to a slightly lesser degree than women (19% in 1991 and 30% in 2015) (Chart 1b).

In 1991, 14% of women had a college diploma[3] compared with 26% in 2015. The percentage of men with a college diploma was 9% in 1991, increasing to 19% in 2015.

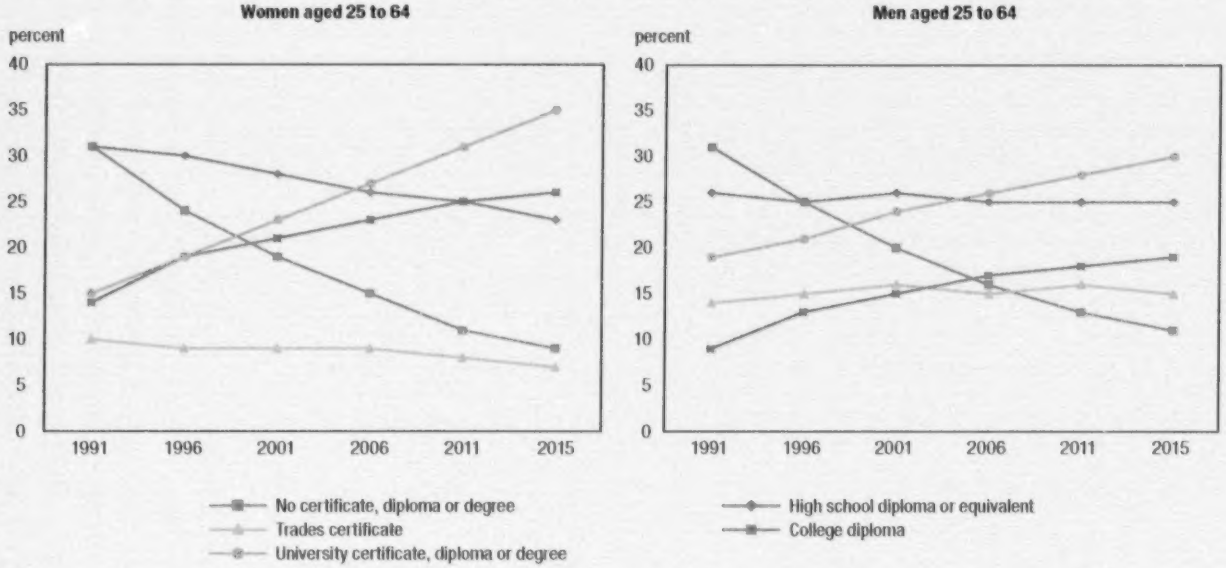
While women were much more likely to hold a college diploma or university certificate or degree in 2015 compared with 1991, the percentage of women with a trades certificate[4] has declined somewhat from 10% in 1991 to 7% in 2015. In comparison, among men, the percentage with a trades certificate[5] has remained relatively constant: 14% of men had a trades certificate in 1991 compared with 15% in 2015.

As women have increasingly completed college and university education, the percentage of women with a high school diploma as their highest completed educational credential has decreased from 31% in 1991 to 23% in 2015. The proportion of men whose highest level of education is a high school diploma remained largely unchanged during the same period (26% in 1991 to 25% in 2015).

Finally, the proportion of women with no formal education credentials[6] (no certificate, diploma or degree) showed a large decline from 31% in 1991 to less than 9% in 2015. The percentage of men with no certificate, diploma or degree showed a similar decline (from 31% to 11%).

1. In this report, levels of education are measured using 'highest certificate, diploma or degree' which codes a person's educational qualifications according to the highest certificate, diploma or degree obtained by a person. For more information on this concept, please see http://www.statcan.gc.ca/concepts/definitions/education06-eng.htm.
2. In this section, 'university certificate or degree' refers to university certificate, diploma or degree (including certificate below bachelors).
3. For the purposes of this report, 'college diploma' refers to college, CEGEP or other non-university certificate or diploma.
4. For the purposes of this report, 'trades certificate' refers to a trades certificate or diploma, including apprenticeship certificates.
5. The LFS does not distinguish those holding registered apprenticeship certificates and those with other forms of trade certificates. LFS provides a good measure of the 'stock' – the total number/proportion of people in Canada who have completed an apprenticeship or trades certificate as the 'highest certificate, diploma or degree' in the specified reference period.
6. For the purposes of this report, the term 'no formal education credentials' refers to persons with 'no certificate, diploma or degree' measured with the 'highest certificate, diploma or degree' variable.

Chart 1a and b
Distribution of women and men aged 25 to 64 by highest certificate, diploma or degree, 1991, 1996, 2001, 2006, 2011, 2015



Note: Excludes the Territories.
Source: Statistics Canada, Labour Force Survey, annual average, 1991, 1996, 2001, 2006, 2011, 2015.

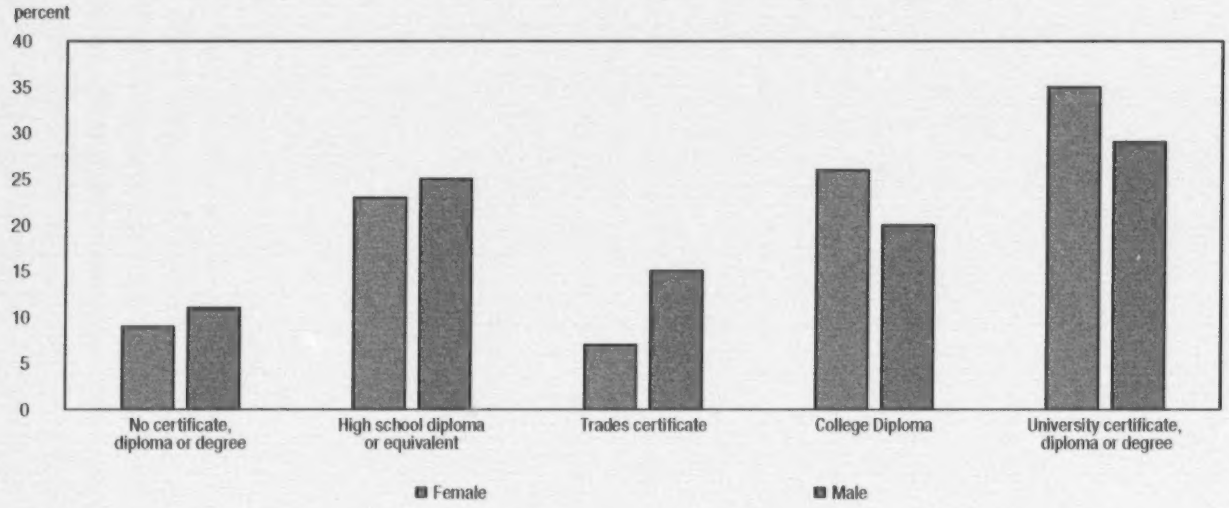
Women more likely than men to have college or university qualifications, less likely to have a trades certificate as their highest credential

While the proportion of those without formal education credentials declined considerably for both women and men, there was a different pattern by sex. Women aged 25 to 64 were more likely to continue on to postsecondary education, particularly college and university, while a higher proportion of men completed a high school diploma or a trades certificate as their highest level of education.

Women were slightly less likely to have completed only a high school diploma compared with men (23% and 25% respectively), while they were more likely than men to have completed a university certificate or degree (35% and 29% respectively).

In 2015, slightly more than one-quarter (26%) of women had a college diploma as their highest level of education compared with one-fifth (20%) of men (Chart 2). Conversely, women were half (7%) as likely to have completed a trades certificate as their highest level of education compared with men (15%).

Chart 2
Distribution of the population aged 25 to 64 by highest certificate, diploma or degree, and by sex, 2015



Note: Excludes the Territories.
Source: Statistics Canada, Labour Force Survey, annual average, 2015.

The number of new female apprenticeship registrations is growing

Analysis in the previous section examined the proportion of all of the women who had ever completed a trades certificate (including an apprenticeship certificate) as their highest level of education. This measure gives a good indication of the stock of women with a trades certificate, but only presents the proportion of women with a trades certificate as their highest level of education. Women who have both a trades certificate as well as a higher credential are categorized under their highest credential completed; for example a college diploma or university certificate or degree.

Another approach would be to use the Registered Apprenticeship Information System (RAIS), which looks specifically at apprentices and reports on the numbers of new apprentices who register and complete their certification in a given year by major trade group.[7]

In the period between 1991 and 2013, the number of new apprenticeship registrations increased threefold, while the growth in female apprenticeship was larger; increasing by 6.7 times to about 14,000 in 2013.[8] The proportion of women among new apprenticeship registrations also grew from 7% to 15% over the same period.

The type of trades groups in which women participated varied from that of men's. In 2013, women continued to represent the majority of new registrations in trade groups such as hairstyling (90%), early childhood education (94%) and user support technicians[9] (54%). Although the proportions tended to remain low, women also accounted for a larger proportion of new registrations in trades that traditionally had high concentrations of men such as welding (7.7%), automotive services (6.1%) and machinist (5.1%) - all groups in which the female proportion of new registrations increased from 2.6% or less in 1991.

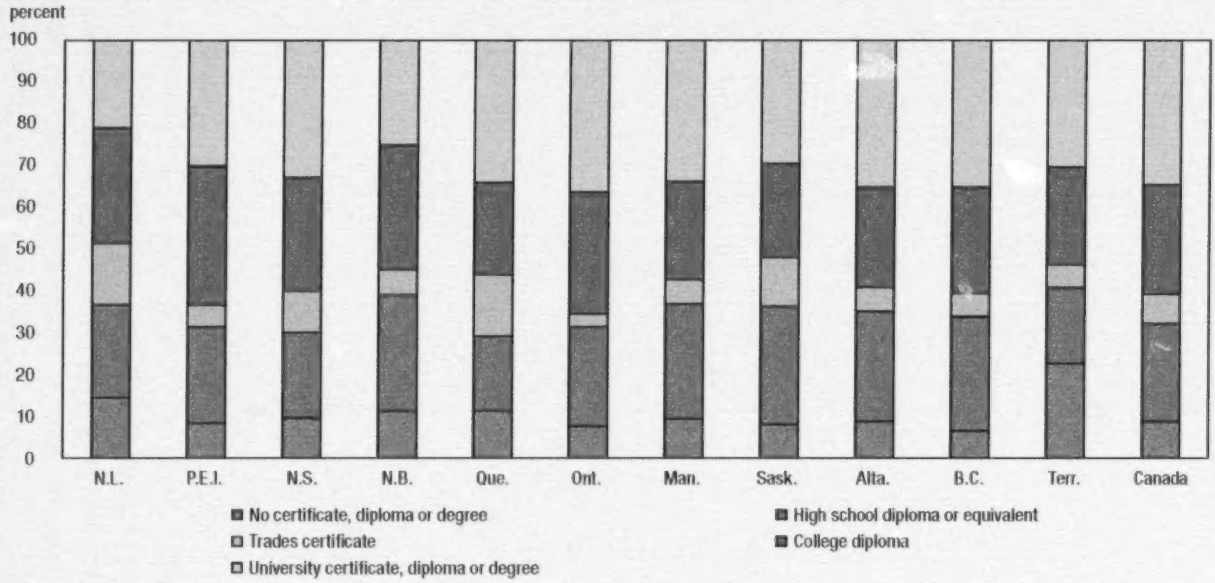
At least one third of adult women in Ontario, British Columbia and Alberta have a university certificate or degree

In 2015, Ontario had the largest proportion of women with a university certificate or degree (36%) followed by British Columbia and Alberta (both at 36%, same as the national average) (Chart 3). The provinces with the largest proportion of women with a college diploma as their highest level of education were Prince Edward Island (33%), New Brunswick (30%) and Ontario (29%). More than double the national average (7%), Newfoundland and Labrador, and Quebec (both at 15%) led the way with the highest proportion of women with an apprenticeship or trades certificate as their highest level of education, followed by Saskatchewan at 12%.

7. The Registered Apprenticeship Information System also collects information on the total number of registered apprentices in a given year (which includes those who are continuing on). For more information on RAIS, please see http://www23.statcan.gc.ca:81/imdb/p2SV.pl?Function=getSurvey&lang=en&db=imdb&adm=8&dis=2&SDDS=3154
8. CANSIM Table 477-0053.
9. User support technicians began to be an apprenticeable trade in some provinces in 2006 and represented 22% of female registrations in 2013.

Quebec (18%) had the lowest proportion of women with a high school diploma as their highest level of education,[10] followed by Nova Scotia (20%). Notably, while all the western provinces had relatively high proportions of women with a high school diploma as their highest level of education (28% in Saskatchewan, 27% in British Columbia and Manitoba, and 26% in Alberta), the proportions of women with no formal educational credentials were low (7% in British Columbia, 8% in Saskatchewan, 9% in Alberta and Manitoba). In contrast, Newfoundland and Labrador (15%) and New Brunswick (11%) had a higher proportion of women with no formal educational credentials, as well as higher proportions with high school as the highest credential (22% and 28% respectively).

Chart 3
Distribution of women aged 25 to 64 by highest certificate, diploma or degree and province and territory, 2015



Note: Total for Canada excludes the Territories.
Source: Statistics Canada, Labour Force Survey, annual average, 2015.

Women account for the majority of recent postsecondary graduates in all provinces and territories

The previous analysis looked at the educational qualifications of the population aged 25 to 64 based on data from the Labour Force Survey, which gives a sense of the educational attainment of the overall working aged population irrespective of whether or not they are in a recent graduating cohort. Examining recent enrolments and graduations from public educational institutions in Canada provides a profile of potential new entrants to the labour market.

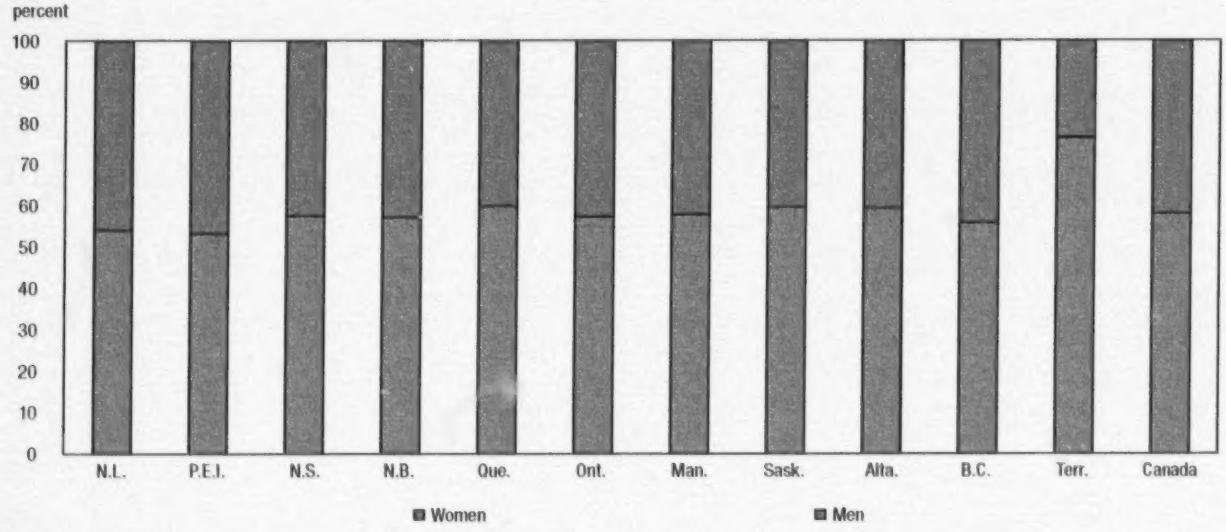
As has been the case since the early 1990's, the majority (56%) of students enrolled in Canada's public colleges and universities in 2013-14 were women. The proportion of women was even higher among those who were enrolled as part-time students (59%). Similarly, women accounted for 58% of the total number of graduates in 2013.

International students account for an increasing proportion of enrolments in Canadian public colleges and universities, at almost 10% of total enrolments in 2013-14. Unlike among overall enrolments where women accounted for the majority, women were proportionally less represented among international student enrolments (46%).

In 2013, the proportion of graduates from colleges and universities that were women was similar across provinces[11] (Chart 4), with Quebec and Saskatchewan having the highest proportion of women among its graduates (both at 60%), followed by Alberta (59%). Just over half of postsecondary graduates in Prince Edward Island (53%) and Newfoundland and Labrador (54%) were women. Among college[12] graduates in the Territories, over three quarters (76%) were women.

10. Quebec offers a trades certificate called a DEP which is offered at the high school level which provides vocational trades training. This certificate is reported by some respondents in the trades category which would decrease the proportion with a high school diploma as the highest, and increase the proportion with a trades certificate as the highest level of education.
11. Postsecondary Student Information System (PSIS) data on graduates are based on the province where the institution is located.
12. In the Territories, the numbers reflect only college graduates, as there are currently no universities in the territories collected in PSIS.

Chart 4
Percentage of women among graduates from public colleges and universities, by province and territory of study, Canada, 2013



Source: Statistics Canada, Postsecondary Student Information System (PSIS), 2013.

The majority of young women completed their postsecondary education in the same province or territory in which they lived in 2011

The 2011 National Household Survey (NHS) collected information on the location of study (province, territory or country) of the highest postsecondary credential obtained. This analysis of young women who have recently graduated from their postsecondary program is useful to examine the mobility patterns by level of education and also to get an indication of the proportion of graduates who continue to live in the same province as where they completed their credential.

Overall, three quarters (77%) of young women aged 25 to 34 with a postsecondary qualification had studied in the same province or territory in which they lived in 2011. Young women with trades (89%) or college certificates or diplomas (87%) were more likely to have earned their highest certificate, diploma or degree in the province in which they lived in 2011, compared with university degree[13] holders (69%). These patterns were similar among young male graduates.

One quarter of female university degree holders completed their degree outside Canada

Female university degree holders aged 25 to 64 (24%) were more likely than trades (7%) or college (8%) certificate or diploma holders to have completed their degree outside of Canada. Of women who completed their degree outside of Canada, 88% were immigrants.[14] The most common locations of study outside Canada among immigrant women with a university degree were the Philippines (9.3%), India (8.2%), and China (5.8%), which were also the three most common countries of origin among female immigrants with a university degree. The locations of study were similar among men, however, a larger proportion of female immigrants completed their degree in the Philippines than among their male counterparts. Among Canadian-born women with a university degree, only 4% had studied outside of Canada and the most common location was the United States. A slightly higher proportion of Canadian-born men with a university degree completed their degree outside of Canada (5%), with the United States being the most common location of study.

Girls score significantly higher in reading than boys, have similar results in science and lower scores in mathematics

Viewing women's education and career path through the lens of a 'pipeline' metaphor can be useful, beginning in high school to identify potential 'leaks' in the pipeline. Examining the skills of girls of high school age, particularly in mathematics is important as these early skills may be related to choosing a STEM program at university.

13. For the purposes of this paper, the term 'university degrees' includes all university degrees at the bachelor's level or above.
14. The denominator includes immigrants and the Canadian-born (excludes non-permanent residents).

Every three years, as part of the Programme for International Student Assessment (PISA), countries across the OECD (Organization for Economic Cooperation and Development) administer a standardized test to 15 year olds to assess how they apply their knowledge and skills in reading, mathematics and science. Each PISA cycle assesses skills in all three areas but has a principal focus in one area. The focus for PISA 2012 was on mathematics.

Results of the 2012 PISA (Table 1) show that Canadian students scored relatively highly in science, with only seven participating countries having a higher average score. In Canada, and among all provinces, there was no significant[15] difference in science scores between girls (524) and boys (527).

Table 1
Average science scores of 15-year old girls and boys in the Programme for International Student Assessment (PISA), 2000, 2003, 2006, 2009, 2012

Year	Girls	Boys
	average science scores	
2000	531	529
2003	516	527
2006	532	536
2009	526	531
2012	524	527

Source: "Women and Education", 2011 (for 2000-2009) and "Measuring up: Canadian Results of the OECD PISA Study", CMEC, 2012.

However, similar to previous Canadian PISA results and to most other OECD countries, in 2012, girls continued to score significantly higher in reading[16] than boys (541 versus 506 respectively, Table 2).[17] The difference in reading scores favouring girls was 35 points, comparable to the average difference between the sexes across all OECD countries (38 points). The gap in average scores between girls and boys has remained relatively stable over time.

Table 2
Average reading scores of 15-year old girls and boys in the Programme for International Student Assessment (PISA), 2000, 2003, 2006, 2009, 2012

Year	Girls	Boys
	average reading scores	
2000	551	519
2003	546	514
2006	543	511
2009	542	507
2012	541	506

Source: "Women and Education", 2011 (for 2000-2009) and "Measuring up: Canadian Results of the OECD PISA Study", CMEC, 2012.

In PISA 2012, Canada opted to include a digital-based reading assessment to a sample of students in addition to the standard paper-based reading assessment. The computer-based tool assessed different skills than the paper version such as searching for information in a simulated online environment. PISA noted the pervasiveness and importance of computers in all aspects of home and work life as well as its role as a learning tool as a reason for conducting a computer-based assessment. The subsequent Canadian PISA assessment (PISA 2015) was conducted entirely using computer-based assessment tools.[18]

Girls performed equally well in reading on each of the assessment modes, scoring significantly higher than boys in both (Table 3). However, boys had better results in digital reading compared with print, narrowing the gap between the sexes. The gap in reading scores favouring girls was 21 points for the digital assessment compared with 35 points for the print assessment.

Table 3
Average reading scores of 15-year old girls and boys in the Programme for International Student Assessment (PISA), 2012

	Girls	Boys	Gap (girls – boys)
	average reading scores		
Composite Reading	**542**	**514**	**28***
Print assessment	541	506	35*
Digital assessment	543	522	21*

* statistically significant difference at the 0.05 level

Source: Programme for International Student Assessment (PISA), 2012. Gaps may not add to totals due to rounding.

15. An observed difference is noted as statistically significant in PISA at the 0.05 level.
16. Historically, the reading assessment conducted in PISA was strictly paper-based, but for the first time in 2012, PISA also included a computer-based reading assessment. In order to remain historically comparable, the scores presented in table 1 are paper-based results.
17. Council of Ministers of Education, Canada, Employment and Social Development Canada and Statistics Canada, Measuring up: Canadian Results of the OECD PISA Study; The Performance of Canada's Youth in Mathematics, Reading and Science 2012 First Results for Canadians Aged 15. 2013. ISBN 978-0-88987-230-1. Toronto.
18. Collection for PISA 2015 occurred in 2015.

Provincially, the gap between scores of girls and boys in digital reading ranged from 14 points in British Columbia to 32 points in Newfoundland and Labrador. In the print reading assessment, the smallest gap was 26 in British Columbia and the largest gap was 53 in Newfoundland and Labrador.[19]

Girls have relatively high achievement in mathematics but gap between the sexes persists

The assessment results in mathematics show that Canadian students at age 15 had relatively high levels of achievement in 2012, with a mean score of 518, which is 24 points above the OECD average.[20] Over the past nine years, the Canadian scores in mathematics have declined in all provinces except Quebec and Saskatchewan (where the decreases were not statistically significant).[21] However, similar to previous PISA results and to most other participating countries, boys scored significantly higher (527) in mathematics compared with girls (514) (Table 4).

Table 4
Average mathematics scores of 15-year old girls and boys in the Programme for International Student Assessment (PISA), 2000, 2003, 2006, 2009, 2012

	Girls	Boys
Year	average mathematics scores	
2000	529	539
2003	530	541
2006	520	534
2009	521	533
2012	514	527

Source: "Women and Education", 2011 (for 2000-2009) and "Measuring up: Canadian Results of the OECD PISA Study", CMEC, 2012.

While boys' mean mathematics scores were significantly higher than girls at the national level, there were significant differences between girls and boys in only half of the provinces (Quebec, Ontario, Alberta, British Columbia and Manitoba). Despite the gap in scores, the provinces with the highest mathematics scores among girls were in these same provinces. Boys in these provinces also had very high scores.[22]

Fewer girls than boys score in the upper range of mathematical proficiency

Scores from PISA were divided into 6 levels which were used to determine mathematical proficiency. However, level 2 is considered the baseline level of mathematical proficiency that is required to participate fully in modern society. In this report, performing below level 2 in the PISA mathematics assessment corresponds to low achievement, whereas performing at level 5 or above corresponds to high achievement.[23]

The gap in overall mathematics scores between girls and boys was not explained by a larger proportion of girls in the lower range of mathematical proficiency. In fact a similar proportion of girls and boys had results below level 2, (13% vs. 14% for boys and girls, respectively). However, a significantly greater proportion of boys scored in the upper range of mathematical proficiency (levels 5 or 6). Among boys, 19% scored at a level 5 or 6 compared with 14% of girls.[24]

Girls performed equally well on the computer-based or paper-based math assessment

For the first time, in PISA 2012, Canada included a computer-based mathematics assessment tool in addition to the digital reading assessment. Similar to the digital reading assessment, the computer-based tool assessed additional skills to the paper version such as selecting certain information from a dataset and sorting on the relevant variables.

The impact on scores of the computer-based mathematics assessment was similar to the digital reading option in that girls scored equally well between modes (514 for computer-based math versus 513 for paper-based math), while boys had higher scores on the computer-based assessment (532 on the computer-based mathematics assessment versus 523 on paper-based math)[25] (Table 5). The result of the higher scores for boys on the computer-based math assessment was that the difference between girls and boys was larger (17 for computer-based math versus 10 for paper-based math).

19. Ibid, pg 43. Weighting of the two modes was equal.
20. Ibid, p 17-18.
21. Council of Ministers of Education, Canada, Employment and Social Development Canada and Statistics Canada, *Measuring up: Canadian Results of the OECD PISA Study; The Performance of Canada's Youth in Mathematics, Reading and Science 2012 First Results for Canadians Aged 15*. 2013. ISBN 978-0-88987-230-1. Toronto, pg 30.
22. Council of Ministers of Education, Canada, Employment and Social Development Canada and Statistics Canada, *Measuring up: Canadian Results of the OECD PISA Study, The Performance of Canada's Youth in Mathematics, Reading and Science 2012 First Results for Canadians Aged 15*. 2013. ISBN 978-0-88987-230-1. Toronto. Pg 69.
23. For more information on proficiency levels in PISA, please see Council of Ministers of Education, Canada, Employment and Social Development Canada and Statistics Canada, *Measuring up: Canadian Results of the OECD PISA Study The Performance of Canada's Youth in Mathematics, Reading and Science 2012 First Results for Canadians Aged 15*. 2013. ISBN 978-0-88987-230-1. Toronto. Pg 27.
24. Ibid, pg 73.
25. There are differences between the computer-based and paper-based assessment tools used in PISA. The computer-based assessment includes elements of mathematics that can only be assessed electronically (e.g., sorting or charting data using a computer) or using computer-based item formats (e.g., drag-and-drop, hot spots). Care must be taken when comparing results between the assessment modalities. p 27.

Table 5
Average mathematics scores of students aged 15 in the Programme for International Student Assessment (PISA), by assessment mode and sex, Canada, 2012

	Girls	Boys	Gap (Girls – Boys)[1]
	average scores in mathematics		
Composite Mathematics	**514**	**527**	**-14***
Paper-based	513	523	-10*
Computer-based	514	532	-17*

* statistically significant difference at the 0.05 level

1. Gaps may not add to totals due to rounding.

Source: Programme for International Student Assessment (PISA), 2012.

With the pervasiveness of technology and the transformation to a screen-based learning environment, it will be important to continue to track these trends.

Girls with higher mathematical ability are less likely to pursue STEM fields at university than boys with lower mathematical ability

The gap in mathematics scores between girls and boys is well documented and has been historically consistent, but how is this related to program choice at university? Examining the relationship between the mathematics skills of girls of high school age and the relationship with program choice at university exposes another 'leak' in the pipeline for girls.

A recent study used PISA scores from 2000 for a cohort of Canadian girls and boys, who were then followed up ten years later to determine if PISA mathematics scores were related to STEM program choice at university.

The 2013 study showed that men were twice as likely to pursue STEM (science, technology, engineering and mathematics) fields at university as women.[26] While women were less likely to pursue STEM programs as their first choice at university, those who did choose STEM programs had high mathematics PISA scores (588) compared with the average for women in any field (569) or women who chose health programs (570). In comparison, the average mathematics PISA score among men who chose STEM programs at university was 597; higher than among men overall (589) and among men who chose health (577) at university. There was no significant difference in the average math scores of women and men who chose STEM programs, however the average scores for men in any field were higher than women in any field.

Controlling for factors that could influence program choice (including immigration status, parental influence variables, and reading scores) to examine the relationship between math ability and STEM program choice revealed that men with high math scores were most likely to choose a STEM program by a margin of 22 percentage points over women with equally high scores.

The key finding of the study was that even young women with a higher level of mathematical ability, (defined as mathematics proficiency levels 4, 5 and 6 at age 15), were less likely to pursue STEM fields at university than young men with a lower level of mathematical ability (proficiency levels 1, 2 and 3).

The study also found that among young women who perceived their mathematics skills to be excellent, 47% chose a STEM program at university compared with 66% of young men with similar positive perceptions. When self-perceived ability and high school marks in mathematics[27] were controlled for, among young women and men with equally high math PISA scores, the gap between women and men in the likelihood of choosing a STEM university program was reduced from 22 to 18 percentage points. The results in this study indicate that self-perceived math ability plays a role in discouraging girls from choosing STEM fields at university. There could be other societal factors at play such as the culture surrounding the study of mathematics and the author noted that the literature points to the potential importance of subject matter interests and occupational preferences.

Women and men have similar literacy skills, while men have higher proficiency in numeracy

This section highlights important issues related to education among adult women in Canada, beginning with skills that are important for success along the education and career pipeline.

The Programme for International Assessment of Adult Competencies (PIAAC) evaluates skills in literacy, numeracy and problem solving in technology rich environments (PS-TRE) among adults aged 16 to 65 (versus the PISA assessment of 15 year olds). Research has shown that literacy and numeracy are associated with higher levels of education and better labour market outcomes.[28]

26. Hango, Darcy. 2013. "Gender differences in science, technology, engineering, mathematics and computer science (STEM) programs at university." *Insights on Canadian Society*. December. Statistics Canada Catalogue no. 75-006-X.
27. Self-perceived mathematical ability was assessed in the Youth in Transition Survey (YITS). Respondents were asked to rate their mathematical ability in high school as 'excellent', 'very good', 'good', 'fair' and 'poor'. High school marks were also collected in YITS.
28. Statistics Canada, Employment and Social Development Canada and Council of Ministers of Education. 2013. *Skills in Canada: First Results from the Programme for the International Assessment of Adult Competencies (PIAAC)*. Statistics Canada Catalogue no. 89-555-X. Ottawa.

PIAAC scores of adults in Canada were at the OECD average (273) for proficiency in literacy. Consistent with results from previous PIAAC assessments, sex was shown to be associated with literacy among those in older age groups and across all ages for numeracy. According to the PIAAC first report[29], in 2012, women and men aged 16 to 65 had similar literacy scores. Literacy proficiency scores for both women and men were lower for the older population compared with their younger counterparts (Table 6). There were no significant[30] differences in average literacy proficiency scores among women and men except among those aged 55 to 65, where men scored 6 points higher than same-aged women.

Table 6
Average literacy and numeracy scores of the adult population aged 16 to 65, by sex and age group, Canada, 2012

	Women	Men	Gap (Women - Men)
	average score		
Literacy			
Total Aged 16 to 65	**272.3**	**274.6**	**-2.3**
16 to 24	276.4	275.1	1.3
25 to 34	284.8	285.4	-0.6
35 to 44	279.3	280.0	-0.7
45 to 54	266	269.9	-3.9
55 to 65	257.3	263.6	-6.3
Numeracy			
Total Aged 16 to 65	**258.2**	**272.7**	**-14.5**
16 to 24	263.7	272.7	-9.0
25 to 34	269.9	283.1	-13.2
35 to 44	264.7	279.1	-14.4
45 to 54	253.0	268.3	-15.3
55 to 65	241.8	261.3	-19.5

Source: Statistics Canada, Programme for International Assessment of Adult Competencies (PIAAC), 2012, Table B.2.3, pg 86.

The mean proficiency score in numeracy of Canadian adults was 266 compared with the mean proficiency score of 269 among OECD countries. In Canada, unlike literacy scores, numeracy scores of women were lower than those of men in every age cohort. The gap in numeracy scores between women and men aged 16 to 24 was 9 points but was higher at 19.5 points for those aged 55 to 65.

Literacy and numeracy are associated with higher levels of education

Scores from PIAAC were divided into 5 levels which were used to determine proficiency in the given skill. Scoring at a level 4 or 5 in literacy proficiency means that a person 'can undertake tasks that involve integrating information across multiple dense texts and reasoning by inference'.[31]

There is a relationship between education, employment and skills proficiency.[32] In 2012, more than one-quarter (27%) of women with a university degree scored at the highest literacy proficiency levels (4 or 5), compared with only 6% of women with a high school diploma or less (Table 7). The pattern and rates were similar among male university degree holders, as a higher proportion (31%) had a proficiency level of 4 or 5 in literacy than those with a high school diploma or less (7%).

The percentage of adults in Canada with a proficiency level of 4 or 5 in numeracy[33] was 13%, which matched the OECD average.[34] However, the proportion of women with a university degree with a proficiency level of 4 or 5 was lower than among their male counterparts. Among women with a university degree, 19% had a proficiency level of 4 or 5 in numeracy compared with 4% among their counterparts with a high school diploma or less (Table 7). In comparison, among male university degree holders, 34% had a proficiency level of 4 or 5 in numeracy compared with 7% among those with a high school diploma or less.

29. Ibid, pg 28-9.
30. An observed difference is noted as statistically significant in PIAAC at the 0.05 level.
31. Ibid, pg 15,18.
32. Statistics Canada, Employment and Social Development Canada and Council of Ministers of Education. 2013. *Skills in Canada: First Results from the Programme for the International Assessment of Adult Competencies (PIAAC)*. Statistics Canada Catalogue no. 89-555-X. Ottawa, pg 27.
33. Scoring at a level 4 or 5 in numeracy proficiency means that a person 'can understand complex mathematical information and work with mathematical arguments and models'. Ibid, pg 18.
34. Ibid, pg 18.

Table 7
Adult population aged 16 to 65 by proficiency level, highest certificate, diploma or degree and sex, Canada, 2012

	PIAAC Level - Women		PIAAC Level - Men	
	Below 4	4 or 5	Below 4	4 or 5
	percent			
Literacy				
High school or less	94	6	93	7
Postsecondary below bachelor's degree	90	10	87	13
University degree[1]	73	27	69	31
Numeracy				
High school or less	96	4	93	7
Postsecondary below bachelor's degree	94	6	85	15
University degree[1]	81	19	66	34

1. University degrees include those with a bachelor's level and above.
Source: Statistics Canada, Programme for International Assessment of Adult Competencies (PIAAC), 2012.

Literacy and numeracy are also associated with employment

A higher proportion of employed women had a literacy proficiency level of 4 or 5 (15%) than women who were out of the labour force (8%) (Table 8). A higher proportion of employed men (16%) had a proficiency level of 4 or 5 in literacy, than their counterparts who were not in the labour force (8%).

The percentage of employed women with a numeracy proficiency level of 4 or 5 was 10% compared with 6% among their counterparts who were not in the labour force (Table 8). Among employed men, 18% had a proficiency level of 4 or 5 in numeracy, compared with 9% among their counterparts who were not in the labour force.

Table 8
Adult population aged 16 to 65 by proficiency level, labour force status and sex, Canada, 2012

	PIAAC Levels - Women		PIAAC Levels - Men	
	Below 4	4 or 5	Below 4	4 or 5
	percent			
Literacy				
Employed	85	15	84	16
Not in the labour force	92	8	92	8
Numeracy				
Employed	90	10	82	18
Not in the labour force	94	6	91	9

Source: Statistics Canada, Programme for International Assessment of Adult Competencies (PIAAC), 2012.

Women and men display similar proficiencies in problem solving

The 2012 PIAAC included an assessment of problem solving skills using digital technology in technology-rich environments (PS_TRE). This assessment measures the respondents' ability to use digital technology, to communicate with others and to solve problems which are commonly encountered in a technology-rich world.[35] Proficiency levels for PS-TRE were determined using average scores and divided into 3 levels.[36]

Overall, a slightly higher proportion of Canadians aged 16 to 65 had a PS-TRE score of level 2 or 3 (37%) compared with the OECD (34%). Similar to literacy, there was no major difference in the PS-TRE scores of women and men except among those aged 55 to 65, where a larger proportion of men (19%) had a PS-TRE proficiency at level 2 or 3 compared with women (14%).[37]

35. For more information on the PS-TRE assessment and descriptions of proficiency levels, please see *Skills in Canada: First Results from the Programme for the International Assessment of Adult Competencies (PIAAC)*. Statistics Canada Catalogue no. 89-555-X. Ottawa, page 8, 25.
36. According to '*Skills in Canada: First Results from the Programme for the International Assessment of Adult Competencies (PIAAC)*, a high proportion of Canadians engage with ICT compared to the OECD average (81% compared with 74%). In Canada, a similar proportion of women and men aged 16 to 65 (at about 82% for both sexes) were assessed for PS-TRE. The main reasons people were not assessed for PS-TRE were that they either had no experience with computer or they failed the test of their basic computer skills.
37. *Skills in Canada: First Results from the Programme for the International Assessment of Adult Competencies (PIAAC)*. Statistics Canada Catalogue no. 89-555-X. Ottawa, pg 86.

Women and family

The education and career trajectory among women can be impacted at different points in life as women fulfill family commitments associated with marriage and children. This may limit women's participation in the labour market, or result in different work histories, for women and men.[38] The next three sections examine young women who are not working or in school - often out of the labour force with children, educational attainment among female lone parents, and the impact of student debt on family formation.

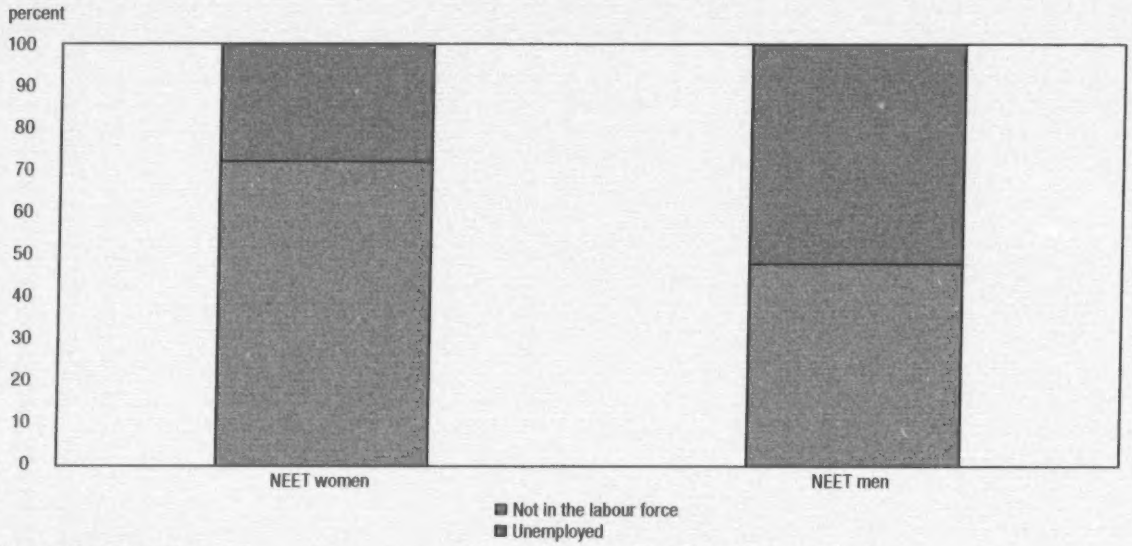
Lower proportion of young Canadian women not working or in school than average for young women in OECD countries

Since the recent economic downturn in 2008, increased attention has been paid to the economic prospects of young people. The proportion of young people aged 15 to 29 who are neither working nor attending school is referred to as the NEET population. Young people who are NEET are at risk of becoming socially excluded, being in low income and may encounter barriers to improving their economic situation.[39] Young women and men had similar rates of NEET in Canada in 2014 (13.6% versus 13.2 %), while the gap is less pronounced than among young women and men at the OECD level (17.9% versus 13.2 %).[40]

Young NEET women less likely to be unemployed and more likely to be out of the labour force than young NEET men

The NEET population can be either unemployed (available for work) or out of the labour force (not available for work for various reasons such as illness or caring for children). NEET can be further broken down by labour force status to better understand the activities of the NEET population. The majority of NEET women were out of the labour force (72%) compared with less than half (48%) of men (Chart 5).

Chart 5
Percentage of NEET (not in employment, education or training) population aged 15 to 29 by labour force status and sex, 2015



Note: Excludes the Territories.
Source: Statistics Canada, Labour Force Survey, 3 month average, January to March 2015.

Previous research examining NEET youth, has shown that women who were married with children were significantly more likely to be out of the labour force, while men who were married with children were significantly less likely to be out of the labour force.[41] In 2015, over one-third (37%) of women with children[42] were NEET compared with only 9% of those without kids.[43] The percentage of men with and without children who were not enrolled in school nor employed was much closer at 16% and 13% respectively. It may be that many young NEET mothers are out of the labour force to provide care for their children.[44]

38. Motherhood and paycheques', in *Canadian Social Trends*, Drolet, Marie, 2003.
39. https://data.oecd.org/youthinac/youth-not-in-education-or-employment-neet.htm
40. Organisation for Economic Co-operation and Development (OECD), *Education at a Glance 2015: OECD Indicators*. (Table C.2.2) and Labour Force Survey, 2014.
41. Marshall, Katherine. 2012. "Youth neither enrolled nor employed." *Perspectives on Labour and Income*. Summer. Statistics Canada Catalogue nº. 75–001–X.
42. Children under the age of 17 were included because the majority (over 99%) of women in NEET had children who were aged 16 and under.
43. Refers to the women in NEET with no children under the age of 25.
44. Marshall, 2012.

Women and family (continued)

Proportion of female lone parents with university degrees has increased at a slower pace than among female parents in couples

In 2011, almost one fifth (19%) of women aged 25 to 54 with children were living in a lone parent family.[45] Female lone parents have different educational outcomes than female parents who are part of couples, and face economic challenges such as a greater prevalence of low income.[46] The proportion of women in both types of families with no formal credentials has decreased dramatically (Table 9). In 1991, just over one third (34%) of female lone parents had not completed high school or any postsecondary qualification (no certificate, diploma or degree). In 2011, this proportion had decreased 21 percentage points to 13%. In comparison, 24% of female parents in couples had not completed high school or any postsecondary qualification in 1991 compared with 8% in 2011 (16 percentage points).

The proportion of women with a university degree in both types of families has increased over time, however at a slower pace for female lone parents. The proportion of female lone parents with a university degree more than doubled between 1991 and 2011 to 20% (a difference of 11 percentage points). The proportion of female parents in couples with a university degree also doubled in that time period to 33% (a difference of 18 percentage points). The gap in education levels between female lone parents and female parents in couples may be partly explained by the tendency for female lone parents have had their children at a younger age.[47]

Table 9

Percentage of Highest certificate, diploma or degree of female lone parents and female parents in couples, aged 25 to 54 with children aged 15 and under in 1991, 2001 and 2011, Canada

Highest certificate, diploma or degree	Female lone parents				Female parent in couples			
	1991	2001	2011	Difference (2011 - 1991)	1991	2001	2011	Difference (2011 - 1991)
	percent							
Total	...	...	...	...	...	...	...	...
No certificate, diploma or degree	34	20	13	**-21**	24	13	8	**-16**
High school diploma or equivalency	30	28	25	**-5**	32	28	21	**-11**
Postsecondary certificate below the bachelor's level	26	39	42	**16**	29	36	38	**9**
University degree at the bachelor's level or above	9	13	20	**11**	15	23	33	**18**

Note: Canada excludes Territories.

Source: Statistics Canada, Labour Force Survey, 1991, 2001, 2011.

45. Milan, Anne, Women in Canada: A Gender-based statistical report, "Families and living arrangements", 2015, Statistics Canada Catalogue no. 89-503-X.
46. Galarneau, Diane, "Education and Income of Lone parents" *Perspectives on Labour and Income*, 2005 Statistics Canada Catalogue no. 75-001-XIE.
47. The 2011 National Household Survey does not measure the age of mothers when they had their children; however a smaller proportion of young female lone parents aged 25 to 34 had children aged 5 or less at home compared with couple mothers. This may indicate that female lone parents had their child earlier in life.

Women and family (continued)

Women with student debt less likely to be married or have children

In order to cover the costs of postsecondary education, many students take out student loans. Rising tuition fees and concern over the opportunities available to new graduates in terms of returns to education have highlighted issues around student debt in Canada. This section looks at the student debt from all sources[48,49] among graduates in 2009-2010 with college diplomas or university degrees and its impact on family formation.

At graduation, female college graduates owed somewhat more than male graduates ($15,900 and $13,400 respectively) (Table 10). Moreover, three years after graduation, women had not repaid as much of their student debt (45%) as men (53%), with women and men owing $8,600 and $6,200 respectively. Three years after graduation, female college graduates had lower average incomes ($35,200) than their male counterparts ($46,500). The higher debt loads and lower income of female college graduates resulted in a higher debt to income ratio, as women owed debt equivalent to 24% of their average income in 2012, three years after graduation, compared with only 13% among their male counterparts (not shown in chart).

Table 10
Profile of 2009-2010 college graduates who owed money on student loans to any source at graduation, by sex, Canada, 2013

College graduates	Both sexes	Females	Males
Number of graduates (nbr)	36,700	21,900	14,800
Average debt at graduation ($)	14,900	15,900	13,400
Large debt at graduation - $25,000 and over (%)	16	17	14[E]
Average debt three years after graduation ($)	7,600	8,600	6,200
Percentage of debt paid off three years after graduation (%)	48	45	53
Employed in 2013 (%)	91	91	90
Average income in 2012 ($)	39,800	35,200	46,500

[E] use with caution

Source: Statistics Canada, National Graduates Survey, 2013 (Class of 2009-2010).

The debt load of female college graduates may be impacting other major life decisions, as a lower proportion of women with student debt at graduation were married (49%) than their counterparts with no student debt (56%). Similarly, one third (33%) of female college graduates with student debt had dependent children, while more than half (54%) of their counterparts without student debt had children (Table 11). The patterns among men were similar.

Table 11
Percentage of selected family characteristics of 2009-2010 college graduates by presence of student debt at graduation, by sex, Canada, 2013

	2009-2010 graduates with student debt to any source at graduation			2009-2010 graduates without student debt at graduation		
	Both sexes	Females	Males	Both sexes	Females	Males
College graduates	percent					
Married or living common-law	47	49	44	56	56	58
With dependent children	28	33	21	50	54	41[E]

[E] use with caution

Source: Statistics Canada, National Graduates Survey, 2013 (Class of 2009-2010).

At the university level[50] on the other hand, female graduates owed a slightly lower amount upon graduation in 2009-2010 ($26,100) than male graduates ($27,900) (Table 12). Women had repaid a slightly higher amount of their student debt than men three years after graduation (53% compared with 51%) contributing to the average remaining debt among female university graduates being slightly lower ($12,300) than male graduates ($13,600). However, women had lower average incomes ($51,100 versus $60,300). Despite the lower incomes, the average debt remaining three years after graduation as a proportion of income three years after graduating was similar among female and male graduates (24% and 23% respectively) (not shown in chart).

48. Includes student debt to all sources including government and non-government (banks, friends, family and credit card debt) loans. The denominator in tables 10 and 12 is those with debt.
49. Student loans/debts differ from one province to the other. For example, debt loads in Quebec tend to be lower. These findings represent the average for Canada.
50. University graduates include those with a certificate below bachelor's level as well as degrees at the bachelor's level or above and exclude all graduates who had returned to school within three years of graduation in 2009/2010.

Women and family (concluded)

Table 12

Profile of 2009-2010 university graduates who owed money on student loans to any source at graduation, by sex, Canada, 2013

University graduates	Both sexes	Females	Males
Number of graduates (nbr)	66,100	39,000	27,100
Average debt at graduation ($)	26,800	26,100	27,900
Large debt at graduation - $25,000 and over (%)	41	40	44
Average debt three years after graduation ($)	12,800	12,300	13,600
Percentage of debt paid off three years after graduation (%)	52	53	51
Employed in 2013 (%)	91	91	92
Average income in 2012 ($)	54,900	51,100	60,300

Source: Statistics Canada, National Graduates Survey, 2013 (Class of 2009-2010).

Among female university graduates, a lower proportion of women with student debt at graduation were married (56%) or had dependent children (27%) compared with their counterparts without debt (72% and 43% respectively) (Table 13). Again, the patterns among men were similar.

Table 13

Percentage of selected family characteristics of 2009-2010 university graduates by presence of student debt at graduation, by sex, Canada, 2013

	2009-2010 graduates with student debt to any source at graduation			2009-2010 graduates without student debt at graduation		
	Both sexes	Females	Males	Both sexes	Females	Males
University graduates	percent					
Married or living common-law	54	56	50	72	72	72
With dependent children	26	27	24	46	43	51

Source: Statistics Canada, National Graduates Survey, 2013 (Class of 2009-2010).

Fewer women among earned doctorate holders than among bachelor's or master's degree holders

Pipeline theory can demonstrate the extent to which women are continuing to flow through academic progression at university in a similar way to men. Leaks in the pipeline can be seen because while women represent the majority of university graduates overall, there is a smaller proportion of women among those at the graduate level particularly among those with a doctorate. According to the 2011 National Household Survey, women accounted for over half (54%) of all university degree holders aged 25 to 64, 55% of bachelor's degree holders, 51% of master's degree holders, but only 39% of earned doctorate holders.

The proportion of graduates that are women is different across generations. In 2011, a much larger proportion of younger doctorate holders were women compared with older degree holders. Among younger earned doctorate holders aged 25 to 34, almost half (47%) were women, compared with almost one third (32%) among doctorate holders aged 55 to 64.

Of the provinces, Nova Scotia had the largest proportion of doctorate holders aged 25 to 64 that were women (43%). Saskatchewan, Quebec and Newfoundland and Labrador followed, each at 40%; slightly higher than the national average of 39%. Women accounted for 39% of earned doctorates in Ontario while Alberta, Manitoba (both at 37%) and Prince Edward Island (31%) had the lowest proportion of earned doctorate holders that were women.

In some fields of study at the doctorate level, women accounted for more than half, for example, education (62%) and social and behavioural sciences and law (51%). Within this latter group, a smaller share of doctorates in social science were earned by women (39%) than in psychology (67%). Almost half (49%) of doctorates in health and related programs were earned by women, while 43% of those with a doctorate in humanities were women.

Women account for a relatively small share of doctorate holders in fields of study such as architecture and engineering

Women accounted for one third of doctorates in physical and life sciences (34%); and represented a larger share among doctorates in the sub-grouping of biological and biomedical sciences (43%) compared with among physical sciences (22%). The fields of study at the doctorate level among which women represented the smallest proportion, were in architecture and engineering (15%) and mathematics, computer and information sciences (21%). Women represented a smaller share of doctorates in the latter two fields of study at the doctorate level then they did at the master's or bachelor's level.

Immigrants accounted for a large proportion of those with a university degree (34%), particularly at the doctorate level. Immigrants accounted for half (50%) of doctorate holders overall[51], but this proportion was somewhat lower among female doctorate holders (45%), compared with among male doctorate holders (54%).

Female doctorate holders were slightly less likely to be employed in 2011 than male doctorate holders (83% versus 87%), though the gap was smaller than among those with a master's degree (79% versus 85%) or among those with a bachelor's degree (80% versus 86%). Employment rates at the doctorate level were high among women who completed their degree in psychology (89%), social sciences (85%) and biology and biomedical sciences (84%).

The 2013 National Graduates Survey asked graduates from a master's program in 2009-2010 their reasons for pursuing an earned doctorate. At just under half (49%), women were less likely to report that the reason they intended to pursue a doctorate was to become a university professor compared with 55% among their male counterparts. About three in ten women (29%) and men (27%) indicated that they wanted to pursue a career outside of academia.

Over one quarter of women with a doctorate working as university professors

Examining the occupation of women with a doctorate can help to evaluate how women are using their education and skills in the labour market and the extent to which there are 'leaks' in the pipeline from academia to career. Among female doctorates holders aged 25 to 64, over one quarter (28%) worked as a university professor in 2011. The proportion of women and men with a doctorate working as a professor was very similar (27.8% and 27.9% respectively). However, younger women with a doctorate were less likely to be working as a professor than their older counterparts. Among female doctorate holders aged 25 to 44, 26% were working as professors, compared with 31% of their older counterparts aged 45 to 64. In comparison, a slightly larger proportion of younger male doctorates (30%) were working as university professors compared with their older counterparts (27%). There are many reasons women may enter tenure track earlier or later including the timing of family formation.

While women form the majority of enrolments at universities, they are less likely to be taught by women. According to the 2010-2011 University and College Academic Staff System (UCASS), among all professors, 37% were women, while only 23% of full professorships were women. Women accounted for a larger proportion of assistant professors at almost half (46%) while over half (54%) of those working as teaching staff without tenure (below assistant professors) were women.

51. Includes Canadian-born doctorate holders and immigrant doctorate holders, but excludes non-permanent residents with doctorates.

Fewer women among earned doctorate holders than among bachelor's or master's degree holders (continued)

The median age of female professors was younger than that of male professors. This difference may play a role in the proportion of professors that are female, as they could be early in their career and not have reached tenure as of yet. For example, the median age of female professors overall was 3 years younger in 2010-2011 than their male counterparts. However, among full professors, the median age of men was only one year greater (at age 57) than that of women (at age 56). The median age of female assistant professors was 40 compared with age 39 among male assistant professors and the median age of both female and male teaching staff without tenure was 49.

Women and men complete their qualifications in different fields of study at the trades, college and university level

According to the 2011 National Household Survey, women were in the minority among those with an apprenticeship certificate as their highest certificate, diploma or degree (2 in 10 apprenticeship certificate holders were women).

In 2011, the top three fields of study among women with an apprenticeship certificate as their highest certificate, diploma or degree were quite different than among their male counterparts (Table 14). The three most common fields of study among women aged 25 to 64 in 2011 with an apprenticeship certificate were personal and culinary services (38%), health professions and related programs (23%) and business, management, marketing and related support services (19%). Examples of specific trades in these fields are hairstyling, health aide, and accounting technology. These are important to note because their outcomes tend not to be as strong as the most common fields among men with a certificate of apprenticeship.

Table 14
Percent distribution of adults aged 25 to 64 with an apprenticeship certificate as the highest level of educational attainment for the top 10 female fields of study, by sex, Canada, 2011

	Female	Female rank	Male	Male rank
	percent	number	percent	number
Proportion with an apprenticeship certificate	**100**	...	**100**	...
Personal and culinary services	38	1	4	5
Health professions and related programs	23	2	1	8
Business, management, marketing and related support services	19	3	2	7
Family and consumer sciences/human sciences	4	4	0	16
Mechanic and repair technologies/technicians	2	5	29	2
Construction trades	2	6	34	1
Precision production	1	7	16	3
Engineering technologies and engineering-related fields	1	8	5	4
Agriculture, agriculture operations and related sciences	1	9	1	9
Visual and performing arts	1	10	1	14
% Represented by top 10 female fields of study	**94**	...	**92**	...

... not applicable

Source: Statistics Canada, National Household Survey, 2011.

The top three fields of study for women accounted for the majority (80%) of all female apprenticeship certificate holders, while these three fields (personal and culinary services, health professions and business, management, marketing and related support services) accounted for only 7% of the trades fields among their male counterparts. On the other hand, the majority (79%) of all male apprenticeship certificate holders were found in construction trades (34%), mechanic and repair technicians (29%) and precision production (16%). Examples of specific trades in these fields are carpentry, auto mechanics and welding. Less than 6% of female apprenticeship completers held a certificate in these areas.

Among women with a college diploma, the most common field of study was business, management, marketing and related support services

In 2011, one-third (34%) of women aged 25 to 64 with a college diploma as their highest level of education had completed their diploma in business, management, marketing and related support services. This grouping accounted for almost one fifth (18%) of men with a college diploma (Table 15). Within this field, women were much more likely to have completed their diploma in administrative assistant and secretarial science, whereas men were more likely to have studied business administration and management and business/commerce.

Apart from business, women and men with a college diploma had fairly dissimilar field of study choices. The second most common field of study grouping for women with a college diploma was in health professions and related programs (27%). A much smaller proportion (4%) of men had completed a diploma in this grouping. Examples of specific fields completed by women with college diplomas in health and related programs were registered nursing, licensed practical nurse and health aide.

The third most common field of study grouping for women with a college diploma was family and consumer sciences (7%). Most women who completed their college diploma in the family and consumer sciences/human sciences grouping studied in the sub-group of child care services. Almost all college diploma holders in this sub-group were women (94%) (not shown in chart).

The top fields of study among women with a college diploma as their highest level of education are subject to high degrees of segregation between the sexes. For example, among those who completed their college diploma in registered nursing, 94% were women. Similarly, among those who completed their diploma in one of the most common business sub-groupings of accounting technology, 74% were women. College programs tend to be occupation-driven and thus subject to occupational segregation by sex.

Table 15

Percent distribution of adults aged 25 to 64 with a college diploma as the highest level of educational attainment, for the top 10 female fields of study and sex, Canada, 2011

	Female	Female rank	Male	Male rank
	percent	number	percent	number
Proportion with a college diploma	**100**	...	**100**	...
Business, management, marketing and related support services	34	1	18	2
Health professions and related programs	27	2	4	7
Family and consumer sciences/human sciences	7	3	1	23
Visual and performing arts	4	4	4	8
Personal and culinary services	3	5	2	11
Education	3	6	1	20
Computer and information sciences and support services	3	7	8	4
Legal professions and studies	3	8	0	26
Public administration and social service professions	2	9	1	21
Engineering technologies and engineering-related fields	2	10	19	1
% Represented by top 10 female fields of study	**88**	...	**58**	...

... not applicable

Source: Statistics Canada, National Household Survey, 2011.

On the other hand, women were less likely to study engineering technologies than men. Engineering technologies and engineering related fields ranked first among men (19%) but tenth among women (2%). Similarly, a lower proportion of women completed their college diploma in computer and information sciences and support services (3%), ranking seventh, compared with men (8%) ranking fourth.

The most common field of study among women with a degree was education

Among university degree holders aged 25 to 64, business, management, and marketing and related support services was an important field of study for both women (ranks 2nd) and men (ranks 1rst). For women with a university degree, the most common field of study was education (19%), while health professions and related programs was the third most common field of study. These three fields accounted for almost half (47%) of female university degree holders compared with about a third of men (35%) (Table 16). Specific examples of fields in these groupings are business administration, primary school teaching, and registered nursing.

Some fields of study that were common among male university degree holders, were not as common among their female counterparts. For example, female degree holders in engineering ranked 7th, while they ranked 2nd among male degree holders. Male degree holders in computer and information sciences ranked 6th, compared with 15th among female degree holders. Similarly, physical sciences ranked 8th among male degree holders compared with 17th among female degree holders.

Table 16
Percent distribution of university degree holders aged 25 to 64, for the top 10 female fields of study, by sex, Canada, 2011

	Female	Female rank	Male	Male rank
	percent	number	percent	number
Proportion with a university degree	**100**	...	**100**	...
Education	19	1	8	4
Business, management, marketing and related support services	15	2	21	1
Health professions and related programs	13	3	6	5
Social sciences	7	4	8	3
Psychology	5	5	2	13
Liberal arts and sciences, general studies and humanities	4	6	2	12
Engineering	4	7	18	2
Visual and performing arts	3	8	2	10
Biological and biomedical sciences	3	9	3	9
Public administration and social service professions	3	10	1	23
% Represented by top 10 female fields of study	**76**	...	**71**	...

... not applicable
Source: Statistics Canada, National Household Survey, 2011.

While women represent the majority of university degree holders in most fields of study, they are still the minority among STEM degree holders

As noted by the Canadian Council of Academies in their 2015 report on STEM skills in Canada, STEM (science, technology, engineering and mathematics and computers) skills lead to improvements in the standard of living and are central to innovation and productivity growth.[52] Encouraging STEM participation among underrepresented groups such as women and Aboriginal people is important to diversify and expand the supply of STEM educated individuals in Canada.[53]

At the individual level, previous reports have also suggested that a STEM degree would lead to better labour market conditions and higher earnings, especially for those with a background in engineering and computer science.[54,55]

In 2011, women accounted for the majority of both university degree holders and non-STEM university degree holders (such as education and health), but were underrepresented among STEM university degree holders. Among adults aged 25 to 64 with a non-STEM university degree, 6 in 10 (61%) were women, while among STEM degree holders 3 in 10 (33%) were women.[56]

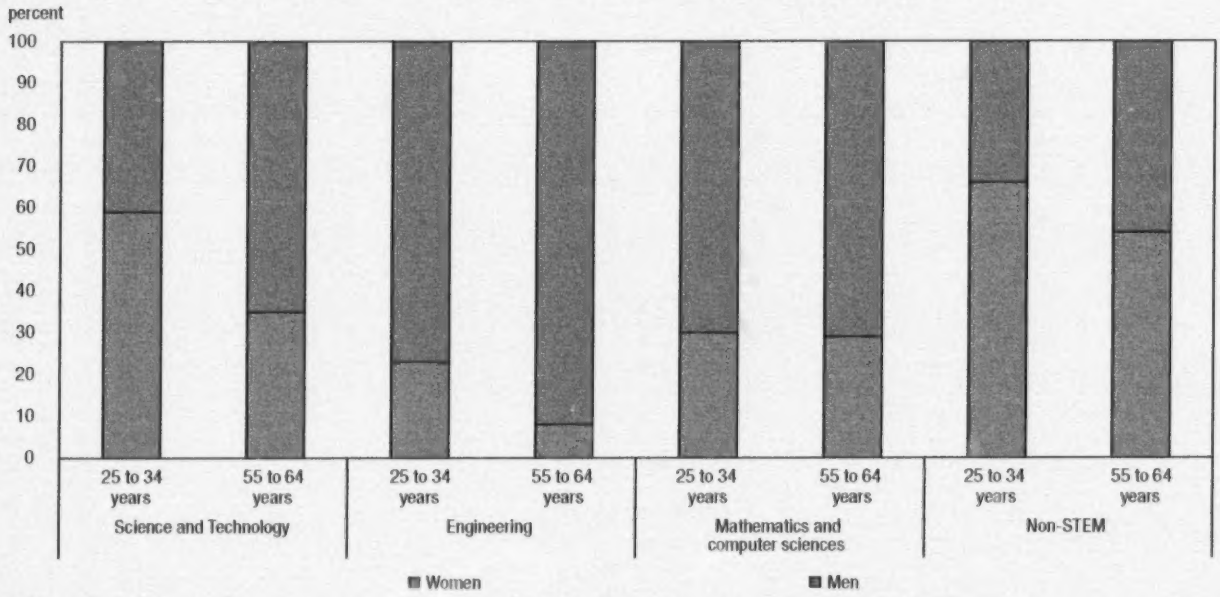
Women account for a higher share of degree holders among younger STEM graduates than among older ones

Comparing the proportion of women among older STEM degree holders with that of younger ones demonstrates that a higher proportion of young STEM degree holders are women compared with older generations (Chart 6). Women represented 39% of university STEM degree holders aged 25 to 34, compared with only 23% of STEM degree holders aged 55 to 64. In non-STEM fields, women accounted for 66% of younger university degree holders, compared with 54% of older ones.

52. Council of Canadian Academies, 2015. *Some Assembly Required: STEM Skills and Canada's Economic Productivity*. Ottawa (ON): The Expert Panel on STEM Skills for the Future, Council of Canadian Academies.
53. Council of Canadian Academies, 2015. *Some Assembly Required: STEM Skills and Canada's Economic Productivity*. Ottawa (ON): The Expert Panel on STEM Skills for the Future, Council of Canadian Academies, pg xvi.
54. The Conference Board of Canada. 2013. Percentage of Graduates in Science, Math, Computer Science, and Engineering. Ottawa.
55. Hango, Darcy. 2013. "Gender differences in science, technology, engineering, mathematics and computer science (STEM) programs at university." *Insights on Canadian Society*. December. Statistics Canada Catalogue no. 75-006-X.
56. Ferguson, Sarah Jane and John Zhao. 2013. *Education in Canada: Attainment, Field of Study and Location of Study*. National Household Survey, 2011. Analytical Document. Statistics Canada Catalogue no. 99-012-X2011001. Ottawa.

The proportion of women among younger STEM degree holders was particularly pronounced among those in science and technology. Women accounted for 59% of younger science and technology degree holders compared with 35% of their older counterparts. The proportion of women among younger engineering[57] degree holders aged 25 to 34 (23%) was almost triple that of engineering degree holders aged 55 to 64 (8%). For degree holders in mathematics and computer science, the proportion aged 25 to 34 (30%) and aged 55 to 64 (29%) that were women was similar.

Chart 6
Percentage of university STEM and non-STEM degree holders by sex and age group, Canada, 2011



Source: Statistics Canada, National Household Survey, 2011.

Women account for twice as many physical science degree holders among younger graduates compared with older ones

The STEM category of science and technology can be further broken down into two sub-groups: biological and biomedical sciences and physical sciences. Women accounted for a larger share of those who completed their university degree in biological and biomedical sciences (56%) than in physical sciences (33%).

Among young biological and biomedical science degree holders aged 25 to 34, young women accounted for the majority (64%). In comparison, women accounted for 40% of biological and biomedical science degree holders aged 55 to 64. The proportion of physical science degree holders aged 25 to 34 that were women was almost double (41%) that of among those aged 55 to 64 (22%).

In 2011, the proportion of women among STEM degree holders aged 25 to 64 varied little across Canada, with most provinces being within 4 percentage points of each other. In all provinces, the share that women accounted for among younger STEM degree holders was at least 13 percentage points higher than their share among older STEM degree holders.

Aboriginal women account for more than one-third of Aboriginal STEM university degree holders

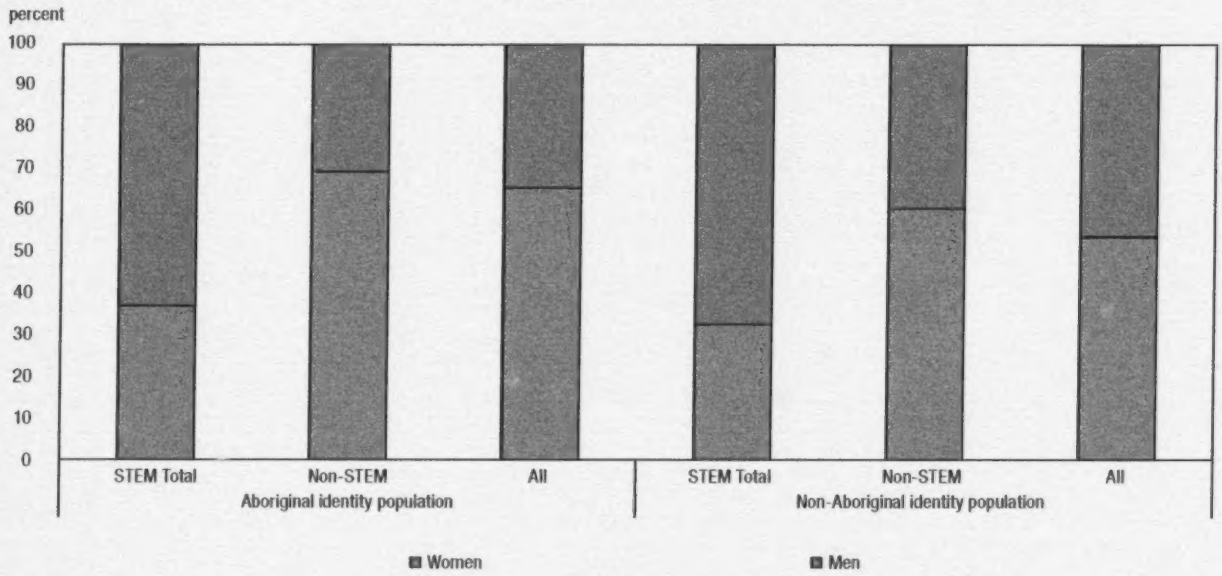
The 2011 National Household Survey showed that similar to their non-Aboriginal counterparts, Aboriginal women[58] accounted for the majority of Aboriginal people with a university degree. Almost two-thirds (65%) of Aboriginal people with university degrees aged 25 to 64 were women, compared with just over half (54%) of same-aged non-Aboriginal degree holders.

57. In this section, the category called 'engineering' refers to the STEM grouping category of 'engineering and engineering technology.' The vast majority of 'engineering and engineering technology' university degrees were accounted for by those who studied 'engineering.' A very small number studied in 'engineering technology' at the university level.
58. A more detailed examination of Aboriginal women and education is available in a previous chapter of *Women in Canada*, "First Nations, Métis and Inuit Women".

Over one-third (37%) of all Aboriginal STEM degree holders aged 25 to 64 were Aboriginal women, compared with 33% of non-Aboriginal STEM degree holders (Chart 7). Among First Nations STEM degree holders aged 25 to 64, 4 in 10 (40%) were First Nations women. Métis women accounted for just over one-third (35%) of all Métis STEM degree holders.[59]

Similar to non-Aboriginal women, young Aboriginal women accounted for a higher proportion of young Aboriginal university degree holders (68%), compared with among older ones (60%). Among non-Aboriginal university degree holders aged 25 to 34, women accounted for 59%, while among older non-Aboriginal degree holders, 47% were women.

Chart 7
Percentage of university degree holders aged 25 to 64 by field of study, Aboriginal identity and sex, Canada, 2011

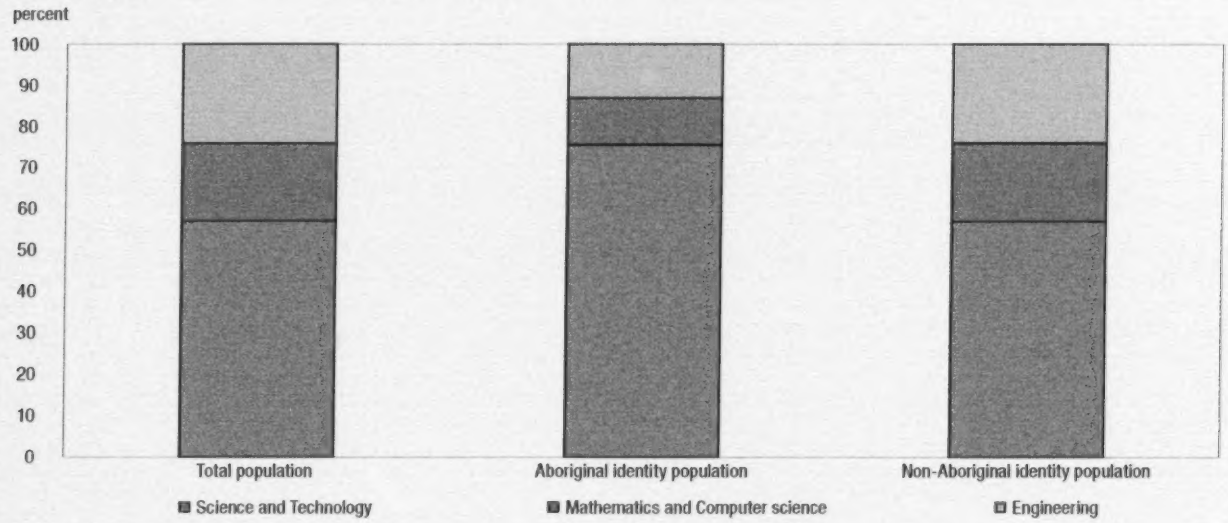


Source: Statistics Canada, National Household Survey, 2011.

Among Aboriginal women with a STEM degree, the majority had studied science and technology (76%). (Chart 8). Engineering was the second most common STEM field for Aboriginal women representing 13% of all female Aboriginal STEM degree holders, while the remaining 11% completed their degree in mathematics and computer science. Similarly, the most common STEM field among non-Aboriginal women was science and science technology (57%), followed by engineering (24%) and mathematics and computer sciences (19%).

59. The proportion of Inuit women aged 25 to 64 among STEM university degree holders was examined but was not included in the analysis due to small counts.

Chart 8
Percentage of female STEM university degree holders aged 25 to 64 by STEM sub-fields of study and Aboriginal identity, Canada, 2011



Source: Statistics Canada, National Household Survey, 2011.

Young female immigrants account for 4 in 10 young female university STEM degree holders

Young female immigrants aged 25 to 34 accounted for a larger proportion of young women aged 25 to 34 with university degrees[60] (27%) than they did of the young female population with a university degree in 2011 (22%). In particular, 41% of young female STEM degree holders were immigrant women. Young immigrant women represented a large share among young female mathematics and computer sciences degree holders (65%) and young female engineering degree holders (54%). On the other hand, young immigrant women accounted for a smaller proportion of young female science and technology degree holders (30%).

The provinces with the largest proportion of female immigrants among female STEM degree holders were Ontario (48%) and British Columbia (46%). On the other hand, the provinces with the lowest proportion of female immigrants among female STEM degree holders were New Brunswick (6%) and Prince Edward Island (8%). This order reflects roughly the prevalence of the immigrant population by province.[61]

Young Canadian-born and immigrant women with STEM degrees have similar unemployment rates to their respective counterparts with non-STEM degrees

The unemployment rate of young Canadian-born women aged 25 to 34 with a STEM degree (4.7%) was slightly higher than among same-aged Canadian-born women with a non-STEM degree (4.3%) (Table 17). The unemployment rates of young immigrant women were higher than their Canadian-born counterparts, but the pattern between STEM and non-STEM disciplines was similar. Young immigrant women with STEM degrees had an unemployment rate that was slightly higher (10.7%) than that of young immigrant women with non-STEM degrees (10.2%).[62]

The higher unemployment rate among all young female STEM degree holders may be at least partly explained by the fact that young immigrant women accounted for a larger proportion of young female STEM degree holders, and their unemployment rates were higher, than Canadian-born STEM degree holders (Table 17). Immigrant women accounted for a larger proportion (41%) of young female STEM degree holders than young female non-STEM degree holders (25%).

60. Includes Canadian-born and immigrants, but excludes non-permanent residents.
61. The number of female immigrants with a university degree aged 25 to 34 over the total female population with a university degree aged 25 to 34 by province.
62. The non-STEM fields are the 2 digit CIP groupings and represent the non-STEM portions. For more information on the STEM variant of the Classification of Instructional Programs, please see http://www23.statcan.gc.ca/imdb/p3VD.pl?Function=getVDPage1&TVD=139116&db=imdb&dis=2&adm=8

Table 17
Unemployment rate of female university degree holders aged 25 to 34 by immigrant status and field of study, and percent of female degree holders aged 25 to 34 that are female immigrants with a degree aged 25 to 34, Canada, 2011

	Unemployment rate - All women aged 25 to 34	Unemployment rate - Canadian - born women aged 25 to 34	Unemployment rate - Immigrant women aged 25 to 34	Percent of female degree holders aged 25 to 34 that are female immigrants with a degree aged 25 to 34
	percent			
Total -all fields	**5.9**	**4.4**	**10.3**	**27**
Total - STEM	**7**	**4.7**	**10.7**	**41**
Science and Technology	6.5	4.9	10.8	30
Mathematics and Computer science	8.5	4.8	10.9	65
Engineering	7.1	3.8	10.3	54
Other	**5.7**	**4.3**	**10.2**	**25**
Education	3.9	3.4	7.9	12
Health professions and related programs	4.4	3.1	9	26
Business, management, marketing and related support services	6.2	3.6	10.2	41

Note: The denominator used to calculate the proportion immigrants by field of study (the last column) excludes non-permanent residents.
Source: Statistics Canada, National Household Survey, 2011.

Among the STEM fields, the unemployment rate of young female Canadian-born engineering degree holders was lower (3.8%) than among mathematics and computer science (4.8%) and science and technology degree holders (4.9%). In comparison, among young immigrant women, there was little difference between the unemployment rates of STEM sub-fields. The high proportion of Canadian-born women who completed their STEM degree in science and technology and the fact that the unemployment rate of graduates in this field is higher can help to explain the higher STEM unemployment rates among Canadian-born women.

Young Canadian-born women who completed their degree in common non-STEM fields had low unemployment rates. For example, the unemployment rate of young female Canadian-born women was 3.1% for degree holders in health and related programs, 3.4% for education degree holders, and 3.6% for business, management, marketing and related support services. Among young female immigrants with university degrees in non-STEM fields, the unemployment rate of those with a degree in education was 7.9%, 9.0% for health and related programs and 10.2% for business, management, marketing and related support services. Almost half of both young Canadian-born and immigrant women completed their university degree in these three fields of study (not shown in chart).

Less than one fifth of all young women with a university degree are overqualified, however this rate rises to one third among their immigrant counterparts

In addition to the importance of finding employment, working in an occupation which requires a skill level corresponding to the level of education is also very important. A 2014 study looked at overqualification among young women and men aged 25 to 34 with a university degree. A university degree holder was defined as being overqualified when they worked in an occupation usually requiring a high school diploma or less.[63,64]

Overall, a similar proportion of women and men were considered overqualified based on the definition above (18.3% compared with 17.7%). However, immigrant women had higher rates of overqualification than both Canadian-born women and immigrant men. Almost 3 in 10 (29%) immigrant women with a university degree were considered overqualified for their occupation compared with less than one-quarter of immigrant men (23%) and 15% of Canadian-born women.

63. Uppal, Sharanjit and Sébastien LaRochelle- Côté. 2014. "Overqualification among recent university graduates in Canada." *Insights on Canadian Society*. April. Statistics Canada Catalogue no. 75-006-X. For more information on overqualification, please see the Data sources, methods and definitions section.
64. A similar concept was examined in an earlier chapter of Women in Canada, *Immigrant Women*, which looked at the proportion of women with bachelor's degrees working in positions that typically require a college education or less. The concept of overqualification as presented here, in contrast, is a more conservative measure which focuses on persons with a bachelor's level education or higher who are working in an occupation that typically requires high school or less. It should be noted that persons in the skill level associated with "management" occupations are excluded from this analysis since the educational requirements for management occupations vary widely by sector.

Young visible minority women who are immigrants are more likely to be overqualified than Canadian-born visible minority women

In 2011, the majority (73%) of female immigrant women aged 25 to 34 with a university degree were visible minorities, compared with 11% of Canadian-born women with degrees in the same age group.

Young visible minority women were more likely to be overqualified than non-visible minority women, but the difference was more pronounced among immigrants than among Canadian-born women (Table 18). Young visible minority women who were immigrants were more likely (31%) to be overqualified for their occupation than immigrant women who were not members of a visible minority group (21%). On the other hand, the overqualification rate of Canadian-born visible minority women was only slightly higher (17%) than Canadian-born women who were not visible minorities (14%).

Table 18
Overqualification rates among workers aged 25 to 34 with a university degree by sex, visible minority and immigrant status, Canada, 2011

	Women		Men	
	Canadian-born	Immigrants	Canadian-born	Immigrants
	percent			
Visible minority population	17	31	17	26
Not a visible minority	14	21	16	19

Source: Statistics Canada, National Household Survey, 2011.

Similar to women, visible minority men who were immigrants were more likely (26%) to be overqualified than immigrant men who were not visible minorities (19%). Among the Canadian-born population, the overqualification rate of male visible minorities was only slightly higher (17%) than those of men who were not visible minorities (16%).

Among immigrants, young Filipino women had the highest rates of overqualification (50%) compared with Chinese women who had the lowest (22%). One fifth (20%) of female immigrants who were overqualified for their occupation in 2011 were Filipino women, while they only accounted for 12% of the female visible minority population. Among Filipino women, 44% had a university degree, but many immigrated to Canada as live-in caregivers.[65]

Overqualification higher among immigrant women who complete their degree outside of Canada or the United States

Overqualification has been shown to be positively associated with completing a university degree outside of Canada or the United States (U.S.).[66] The overqualification rate for immigrant women who completed their degree in Canada or the U.S. was lower (20%) than among immigrant women who completed their degree outside of Canada or the U.S. (43%). However, the overqualification rate of immigrant women who completed their degree in Canada or the U.S. (20%) was notably higher than among Canadian-born women (15%), whereas the differences between the corresponding male groups was negligible (16% versus 15%). Similar to immigrant women, immigrant men who completed their degree outside Canada or the U.S. also had much higher rates of overqualfication (35%), compared with immigrant men who completed their degree in Canada or the U.S. (16%).

Female degree holders in health, architecture and engineering, and education have lowest rates of overqualification

The overqualification rate among degree holders aged 25 to 34 also varied by field of study. Among female Canadian-born graduates, the three lowest rates of overqualification were among those in health and related fields (5%), architecture, engineering and related technologies (7%) and education (7%). Among young male Canadian-born degree holders, the lowest overqualification rates were among those who graduated in architecture, engineering and related technologies (5.1%), mathematics, computer and information sciences (6.3%) and education (7.8%). The rate of overqualification among Canadian-born men who completed their degree in health was considerably higher than among their female counterparts at 9.1%.

The highest rates of overqualification among young female Canadian-born degree holders were in non-STEM fields such as humanities (29%), visual and performing arts[67] (28%) and social and behavioural sciences and law (22%). These three fields accounted for more than 5 in 10 (54%) overqualified young female Canadian-born degree holders. Among young male Canadian-born degree holders, the highest overqualification rates were among those

65. According to the 2013 IMDB (Longitudinal Immigration Database), 90% of live-in caregivers (principal applicants) who landed in Canada from 2006 to 2011 and filed taxes in 2010 were born in the Philippines.
66. Uppal, Sharanjit and Sébastien LaRochelle- Côté. 2014. "Overqualification among recent university graduates in Canada." *Insights on Canadian Society*. April. Statistics Canada Catalogue no. 75-006-X. For more information on overqualification, please see the Data sources, methods and definitions section.
67. Refers to the CIP primary grouping of Visual and performing arts and Communication technologies.

who graduated in humanities fields (30.5%), and social and behavioural sciences and law (22.9%) and visual and performing arts (22.6%). These three fields accounted for almost half (48%) of young Canadian-born overqualified men (not shown in chart).

While the rates of overqualification were much higher among female immigrants than their Canadian-born counterparts, the fields of study with the lowest rates of overqualification were the same. Among young female degree holders who were immigrants, the fields of study with the lowest rates of overqualification were architecture, engineering and related technologies (18.1%), health (22.4%) and education (22.8%); the same fields of study as among young Canadian-born female degree holders. The two lowest rates of overqualification among young male immigrants were and mathematics, computer and information sciences (12.7%) and architecture, engineering and related technologies (15.7%), the same fields of study as among young Canadian-born male degree holders.

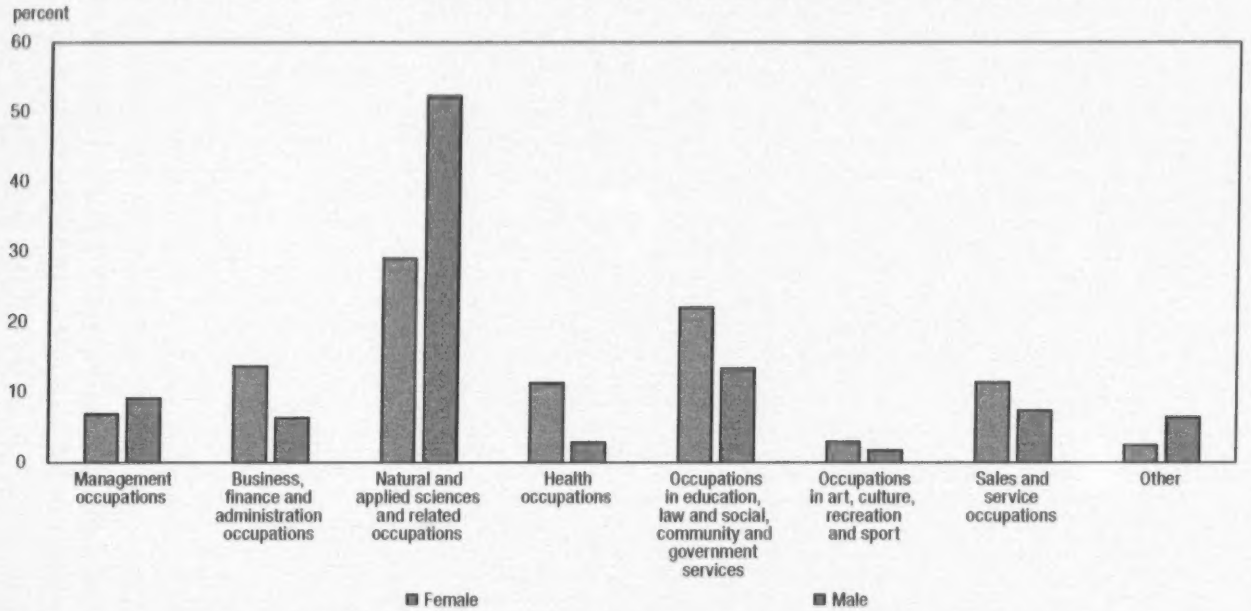
The most common occupation group among young female STEM degree holders is natural and applied sciences and related occupations

While previous sections examined the distribution by field of study among STEM graduates to look at the supply of STEM graduates, the following section examines the occupational profile of these recent graduates. This analysis can evaluate leaks in the pipeline to determine in which occupations young STEM educated women are working.

In 2011, the most common major occupational grouping that employed young women aged 25 to 34 with a STEM university degree was natural and applied sciences (Chart 9).[68,69] Almost 3 in 10 (29%) young women with a STEM university degree worked in natural and applied sciences. In comparison, over half (52%) of young male STEM degree holders worked in natural and applied sciences occupations.

Apart from natural and applied sciences occupations, the two occupation groups accounting for the highest proportion of young female STEM degree holders were occupations in education, law and social and government services (22%) and business, finance and administration (14%).

Chart 9
Percentage distribution of STEM university degree holders aged 25 to 34 by major occupation group and sex, Canada, 2011



Source: Statistics Canada, National Household Survey, 2011.

68. Refers to the National Occupation Classification (NOC) occupation major grouping of natural and applied sciences and related occupations. This occupational grouping includes all professional and technical occupations in engineering, mathematics and physical and life sciences requiring a postsecondary education in an appropriate scientific discipline. The National Occupational Classification (NOC) does not contain groups of occupations in the sciences in the same way that the Classification of Instructional Programs (CIP) has a group of fields of study, referred to as 'science, technology, engineering and mathematics' (STEM). This article identifies the occupations of persons with a STEM degree. While in reality the occupations of those who hold a STEM degree go beyond the occupational grouping of 'natural and applied sciences', this occupational group is the one that most closely corresponds to the STEM field of study. http://www.statcan.gc.ca/pub/12-583-x/12-583-x2011001-eng.pdf pg15.
69. Analysis was conducted among the adult population aged 25 to 64, and the proportion of female STEM graduates working in natural and applied sciences was similar (28%), suggesting that this pattern is not solely related to being a recent graduate.

Over half of young female engineering graduates are working in natural and applied sciences

Among young female STEM degree holders, those who studied engineering[70] were the most likely to be working in natural and applied science related occupations. Just over half (53%) of young women with a degree in engineering were working in natural and applied sciences, while this proportion was higher among their male counterparts at nearly two thirds (62%). Over one third (36%) of young women with a degree in mathematics and computer science were working in natural and applied science occupations, compared with 61% of young men with a degree in mathematics and computer sciences.

Finally, almost one fifth (19%) of women with a degree in science and technology were working in natural and applied science occupations compared with just over one quarter (26%) among their male counterparts. While this proportion was smaller than among the other STEM sub-fields, the most common occupational grouping among female science and technology degree holders (other than natural and applied science) were occupations in education, law and social and government services (27%) followed by health occupations (17%).

The occupations in the grouping of sales and services are primarily low skill[71], and include sales occupations, personal, security and tourism services. The proportion of women working in sales and service occupations was the same among those with a STEM degree (11.4%) as among female degree holders overall (11.5%). On the other hand, among men with a STEM degree, fewer (7.4%) worked in sales and service occupations compared with male degree holders overall (10.9%).

The most common occupation among young women with a university degree is elementary/kindergarten teacher

The extent to which the pipeline from education to career path has some 'leaks' along the way can be evaluated by comparing at the most common occupations among women and examining which occupations have become more or less segregated by sex.

A recent study[72] looked at whether the significant growth in the proportion of younger employed women with university degrees had translated into corresponding changes in women's occupational profile since 1991. While the proportion of young employed women aged 25 to 34 with a university degree doubled between 1991 (19%) and 2011 (40%), the top three occupations among young women with a university degree remained the same. In 2011, the top three occupations held by young female workers with a university degree were elementary/kindergarten school teachers, registered nurses and secondary school teachers (Table 19).

Table 19

Percentage of the 5 occupations employing the most women and men aged 25 to 34 with a university degree in 1991, 2006 and 2011, Canada

Occupation	1991	2006	2011
	percent		
Women			
Elementary school and kindergarten teachers	11.8	11	9.8
Registered nurses	4	4.2	6.1
Secondary school teachers	5.4	5	4.8
Financial auditors and accountants	2.8	3	3
General office clerks	1	1.8	2.1
Percentage working in top 3 occupations	**21.2**	**20.2**	**20.7**
Total Occupation	**100**	**100**	**100**
Men			
Computer programmers and interactive media developers	...	4.2	3.6
Computer programmers	2.4	...	...
Financial auditors and accountants	3.9	2.9	3.5
Secondary school teachers	4.1	3.8	3.4
Information systems analysts and consultants	...	3.6	2.9
Percentage working in top 3 occupations	**11.7**	**11.6**	**10.5**
Total Occupation	**100**	**100**	**100**

... not applicable

Source: Statistics Canada, 1991Census, 2006 Census, National Household Survey, 2011, reproduced from Uppal, Sharanjit and Sébastien LaRochelle- Côté. 2014.

70. Among the STEM fields (science and technology, math and computer science and engineering), the proportion of engineering degree holders was the only field that was very different between the Canadian-born and overall degree holders. Just over half (53%) of female immigrants with an engineering degree were working in natural and applied science compared with 64% of female Canadian-born engineering degree holders.
71. Defined by skill level in the National Occupational Classification (NOC). The majority (74%) of adults aged 25 to 64 working in this occupation grouping had a high school diploma or less.
72. Uppal, Sharanjit and Sébastien LaRochelle- Côté. 2014. "Changes in the occupational profile of young men and women in Canada." *Insights on Canadian Society.* April. Statistics Canada Catalogue no. 75-006-X.

These top three occupations represented a large proportion of employed women over time: at least one-fifth of employed women in both 1991 and 2011. The percentage of elementary or kindergarten teachers decreased slightly from 12% in 1991 to 10% in 2011, while the percentage of registered nurses increased somewhat from 4% to 6%.

In 2011, the top three occupations among young employed men with a university degree were computer programmers and interactive media developers, financial auditors and accountants and secondary school teachers. These were similar to the top three occupations among young employed men with a university degree in 1991. However, moving beyond the top 5 occupations, the occupational profile of young male degree holders reflects the expansion in the information technology sector between 1991 and 2011. In 1991, there were just two categories related to information technology in the National Occupational Classification (NOC). Together, they accounted for 6% of young employed men with a university degree (not shown in chart). In the 2011 NOC, there were 5 categories related to information technology. The 5 categories combined accounted for 9% of young employed men with a university degree.

Share of female workers rising in occupations held by university graduates

Given the rapid increase between 1991 and 2011 in the proportion of young employed women with university degrees (19% to 40%), compared with that for young employed men (17% to 27%), it is to be expected that the proportion of women in occupations held by university graduates would naturally rise. This section examines changes in the composition by sex between 1991 and 2011 by regrouping the occupations held by young workers aged 25 to 34 into three categories: those in the top 25 occupations for both women and men, those in the top 25 occupations for women only, those in the top 25 occupations for men only.

Within occupations shared by both male and female graduates (the top 25 occupations for young women and men aged 25 to 34 with university degrees in 2011), the proportion of degree holders in sales, marketing and advertising managers that were women rose 17 percentage points from 1991 to 2011 (from 35% to 52%). Similarly, women accounted for 58% of lawyers in 2011 (an increase of 16 percentage points).

Two thirds of general practitioners and family physicians are women

Women made even larger gains in the second grouping (occupations only appearing among the top 25 occupations for women with a university degree in 2011). For example, women increased their share of health policy researchers by 29 percentage points to 76%. Women became the majority (62%) of general practitioners and family physicians in 2011, up from 43% in 1991.

Female degree holders also accounted for a larger proportion of those with a degree in several of the occupations in the third grouping (occupations which appeared in the top 25 occupations held by young male degree holders in 2011). For example, the female share of civil engineers increased 15 percentage points to 26% and increased 14 percentage points to 34% of police officers. While the female share of mechanical engineers (12%) remained relatively small in 2011, it doubled from 6% in 1991.

The study also looked at the concentration of women and men in the top occupations among those without a university degree. Some of the occupations of those without a university degree that had a high female concentration remained highly concentrated. For example, the large majority (86%) of nurse aides were women in 2011, an increase of 8 percentage points since 1991. Other occupations that continued to be largely female were early childhood assistants and secretaries (both 97%).

Some occupations of those without a university degree that previously had a large female share became somewhat less female concentrated. For example, the share of women declined by 15 percentage points among customer service representatives in financial services (from 95% to 79%), and by 13 percentage points among food counter attendants and kitchen helpers (from 79% to 65%). On the other hand, in 2011, women accounted for less than 5% of young employed people without a university degree in occupations that already had a high proportion of men such as heavy equipment operators, truck drivers, plumbers and carpenters.

Employment income among women is more comparable with men's at the university level than other levels

Over time, women have increasingly completed higher levels of education. Among paid workers aged 25 to 64 employed full time and full year,[73,74] the earnings ratio between women and men was generally positively associated with level of education (Table 20).

While the proportion of women with no formal education credentials has been decreasing, this population could be considered vulnerable as many occupations now require a higher level of skill. Women with neither a high school diploma nor any postsecondary qualification earned 70 cents for each dollar earned by their male counterparts.

73. Paid workers (excluding those who are self-employed) working full time and full year were defined as those who worked more than 30 hours per week and between 49 and 52 weeks per year.
74. Even among paid workers who worked full-time and full-year, women may still work fewer hours and weeks than men, which could account for some of the gender gap in earnings.

The earnings ratio between women and men increased with most levels of education to 0.87 among those with an earned doctorate. In general, the earnings ratios were at 0.80 or higher at the university level of education, while they were below 0.80 at other levels of education.

Earnings of graduates from fields of study with high female concentration are generally lower than in male concentrated fields of study

The earnings ratio (0.57) between women and men among those with an apprenticeship certificate was the lowest of all levels of education. There was a substantial earnings advantage (26%) for male apprenticeship certificate holders ($61,034) compared with those with only a high school diploma ($48,510), and a slight advantage (3%) over those with a college diploma ($59,304). In comparison, women with a college diploma had 24% higher earnings ($43,415) than women with an apprenticeship certificate ($34,959) and 15% higher earnings than those with only a high school diploma ($37,859).

Table 20

Median annual employment income in 2010 and gender ratio of paid employees who worked full time and full year, aged 25 to 64, by highest certificate, diploma or degree, and sex, 2011, Canada

	Women	Men	
	Annual median employment income ($)		Ratio
Total population	**44,850**	**57,549**	**0.78**
No certificate, diploma or degree	29,548	42,140	0.70
High school diploma or equivalency certificate	37,859	48,510	0.78
Other trades certificate or diploma	34,825	48,506	0.72
Registered apprenticeship certificate	34,959	61,034	0.57
College diploma	43,415	59,304	0.73
University certificate or diploma below bachelor level	49,986	62,298	0.80
University degree at bachelor level or above	62,508	75,520	0.83
Bachelor's degree/Above Bachelor's certificate	60,103	72,410	0.83
Degree in medicine, dentistry, veterinary medicine or optometry	66,886	88,842	0.75
Master's degree	70,335	82,768	0.85
Earned doctorate	82,977	95,777	0.87

Source: Statistics Canada, National Household Survey, 2011.

The lower earnings ratio between women and men with an apprenticeship certificate as their highest level of education can be partly explained by field of study differences. For example, the most common field of study of female apprenticeship certificate holders who worked full time and full year was personal and culinary services (35%), for which the annual median employment income was $30,898 (Table 21). The majority of women in this field studied hairstyling. This compared with the median earnings of $61,526 for the top apprenticeship field of study for men, namely mechanic and repair technologies/technicians. This field accounted for just over one third (34%) of male apprenticeship certificate holders who worked full time and full year.[75]

While the overall difference in employment income a between women and men with an apprenticeship certificate may be partly explained by the fact that women complete their apprenticeship in lower paying fields, even among the same field of study groupings, women tend to earn less. For example, examining the most common fields of study among male apprenticeship certificate holders, the employment income of women with an apprenticeship certificate in mechanics and repair technologies was $43,605. Similarly, the employment income of women with an apprenticeship certificate in construction trades who worked full time and full year, earned was $44,002 while the employment income of women who completed their certificate in precision production was $34,962.

75. The top field of study for male apprenticeship certificate holders differed in table 21 compared with table 14 because male mechanics were more likely to work full time full year than those in construction trades and therefore represented a larger share of the total.

Table 21
Median annual employment income in 2010 of paid employees working full time and full year with an apprenticeship certificate aged 25 to 64 for three fields of study with the highest proportion of graduates by sex, 2011, Canada

	Apprenticeship certificate	
	%	$
Female		
Field of study	**100**	**34,959**
Personal and culinary services	35	30,898
Health professions and related programs	24	37,421
Business, management, marketing and related support services	21	36,771
Male		
Field of study	**100**	**61,034**
Mechanic and repair technologies/technicians	34	61,526
Construction trades	31	65,735
Precision production	15	60,111

Source: Statistics Canada, National Household Survey, 2011.

Women with a college diploma earned 73 cents for each dollar earned by their male counterparts. Field of study preferences again played a role (Table 22). The most common field of study among male college diploma holders was engineering technology, a field associated with high employment incomes among men ($66,962), while the employment income of the most common field of study of their female counterparts was business, management, marketing and related support services with a median employment income of $43,645. Even among graduates in the same field of study grouping, women earned less; male college graduates in business, management, marketing and related support services earned $56,816. This could be partly explained by differences in the sub-fields of study between women and men. The most common sub-field among female business graduates at the college level was administrative assistant and secretarial science. Among male business graduates at the college level, the most common field of study was business administration and management.

One quarter of women with a college diploma studied in health and related fields and earned higher than the overall median employment income for college diploma holders ($46,047 compared with $43,415). After business and health, female college diploma holders were distributed in small numbers across many fields of study. The third largest field of study at this level was family and consumer sciences with median employment income of college diploma holders at $36,266. Women who studied in this field did so primarily to become a child care provider/assistant.

Table 22
Median annual employment income in 2010 of paid employees aged 25 to 64, working full time and full year with a college, CEGEP or non-university diploma, for the three fields of study with the highest proportion of graduates by sex, 2011, Canada

	College diploma	
	%	$
Female		
Field of study	**100**	**43,415**
Business, management , marketing and related support services	37	43,645
Health professions and related programs	25	46,047
Family and consumer sciences/human sciences	6	36,266
Male		
Field of study	**100**	**59,304**
Engineering technologies and related fields	21	66,962
Business, management, marketing and related support services	18	56,816
Mechanic and repair technologies/technicians	11	60,505

Source: Statistics Canada, National Household Survey, 2011.

As stated earlier, the earnings ratio between women and men at the university level was higher than among those with a trades or college diploma. Women with a bachelor's degree or a certificate above the bachelor's level earned 83 cents for each dollar earned by their male counterparts. This ratio increased to 0.87 among those with an earned doctorate (Table 20).

The earnings ratio between women and men of those with a degree in medicine, dentistry, veterinary medicine or optometry was notably lower (0.75) than master's (0.85) or doctorate graduates (0.87). These ratios are calculated on the employment income of paid employees and excludes the self-employed. A higher proportion of individuals aged 25 to 64 among those with a degree in medicine, dentistry, veterinary medicine or optometry, were self-employed in private practice (41%) compared with the overall population aged 25 to 64 (10%). Female degree holders in medicine, dentistry, veterinary medicine or optometry were less likely (33%) to be self-employed than their male counterparts

(47%). The earnings ratio of women and men who were self-employed with a degree in medicine, dentistry, veterinary medicine or optometry was much higher (0.94) than among paid employees (0.75). Both female and male self-employed degree holders in medicine, dentistry, veterinary medicine or optometry had much higher median annual earnings ($117,988 and $126,023 respectively) than their paid employee counterparts.

Graduates in health and related fields are the highest earners among female university degree holders

The earnings ratio of women and men aged 25 to 64 who had a university degree at the bachelor's level or above varied by field of study (Table 23). Women with a degree in health and related fields (working full time and full year) earned 91 cents for each dollar earned by their male counterparts in 2010 and earned $70,288. Half of women with a degree in health (excluding those with a medical degree), had completed their degree in the sub-field of nursing. Nursing graduates working full time and full year had higher employment income ($73,399) than the median for all female degree holders who worked full time and full year ($62,508).

Women with a degree in education who worked full time and full year had higher employment income than the median for all female degree holders who worked full time and full year ($66,335 compared with $62,508) and had the second highest earnings ratio (90 cents for each dollar earned by their male counterparts).

The earnings ratio between women and men was the lowest among those with degrees in business, management and public administration, architecture, engineering, and related technologies, and physical and life sciences and technologies, (all three fields at 0.78). The employment income in 2010 of female Canadian-born university graduates tended to be higher than the female immigrant population with degrees ($65,366 compared with $54,165). The median employment income of female Canadian-born graduates of architecture and engineering was $73,791, ranking first.

Table 23

Median annual employment income in 2010 of paid employees, working full time and full year aged 25 to 64 and had a university degree at the bachelor's level or above, by field of study[1] and sex, Canada, 2011

		Women	Men	
	Female distribution (%)	Annual median employment income ($)		Ratio
Total university degree holders	**100**	**62,508**	**75,520**	**0.83**
Health and related fields	13.7	70,288	76,856	0.91
Mathematics, computer and information sciences	3.4	66,679	75,409	0.88
Education	20.5	66,335	74,110	0.90
Architecture, engineering, and related technologies	4.5	63,593	81,350	0.78
Business, management and public administration	20.6	62,041	79,778	0.78
Physical and life sciences and technologies	6.5	59,714	76,323	0.78
Agriculture, natural resources and conservation	1.5	58,032	70,261	0.83
Social and behavioural sciences and law	17.7	57,609	73,084	0.79
Humanities	9.4	53,351	61,326	0.87
Visual and performing arts, and communications technologies	2.4	48,245	54,791	0.88

1. The primary groupings: Personal, protective and transportation services and other fields of study have not been included as they represent only 0.4% of the female population with a university degree aged 25 to 64.

Source: Statistics Canada, National Household Survey, 2011.

The employment income reported in this section reflects that of paid employees working full time and full year but beyond that the numbers are 'unadjusted' for other determinants. Researchers have analyzed a number of other factors that play a role in determining the gap in employment income between women and men such as occupation, work experience and career interruptions, unionization, family gap, and job preferences. The impact of these factors on the gap in employment income between women and men are beyond the scope of this chapter.[76,77]

76. A subsequent chapter of Women in Canada, on women and earnings, will provide more detail on the economic well-being of women in Canada.
77. Drolet, M. 2002. *The "Who, What, When, and Where" of Gender Pay Differentials*. The Evolving Workplace Series no. 4. Statistics Canada Catalogue no. 71-584-MIE. Ottawa: Statistics Canada and Human Resources Development Canada.